

Draft Environmental Impact Statement

For The Generic Essential Fish Habitat Amendment to:

SPINY LOBSTER FISHERY MANAGEMENT PLAN
QUEEN CONCH FISHERY MANAGEMENT PLAN
REEF FISH FISHERY MANAGEMENT PLAN
CORAL FISHERY MANAGEMENT PLAN
FOR THE U.S. CARIBBEAN

VOLUME 2: TABLES AND FIGURES

June 2003

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This is a publication of the Caribbean Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award No. NA17FC1051.



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Table 2.1. List of species or species groups in the Spiny Lobster FMP.

Panuliridae

Caribbean spiny lobster, *Panulirus argus*

Spotted spiny lobster, *Panulirus guttatus*

Smoothtail spiny lobster, *Panulirus laevicauda*

Table 2.2. List of species or species groups in the Queen Conch FMP.

Phylum Mollusca, Class Gastropoda (Snails), Order Mesogastropoda, Family Strombidae

Strombus gigas

S. costatus

S. pugilis

S. gallus

S. raninus

Family Fascioliariidae

Fasciolaria tulipa

Family Cymatiidae

Charonia variegata

Family Cassidae

Cassis flammea

C. madagascarensis

C. tuberosa

Family Trochidae

Cittarium pica

Astrea tuber

Family Turbinellidae

Vasum muricatum

Table 2.3. List of species or species groups in the Reef Fish FMP.

Morays - Muraenidae

1. Chain moray, *Echidna catenata*
2. Green moray, *Gymnothorax funebris*
3. Goldentail moray, *Gymnothorax miliaris*

Snake eels - Ophichthidae

4. Goldspotted eel, *Myrichthys oculatus*

Lizardfishes - Synodontidae

5. Sand diver, *Synodus intermedius*

Frogfishes - Antennariidae

6. Frogfish, *Antennarius spp.*

Batfishes - Ogcocephalidae spp.

7. Batfish, *Ogcocephalus spp.*

Squirrelfishes - Holocentridae

8. Squirrelfish, *Holocentrus ascensionis*
9. Longspine squirrelfish, *Holocentrus rufus*
10. Blackbar soldierfish, *Myripristis jacobus*
11. Cardinal soldierfish, *Plectrypops retrospinis*

Trumpetfishes - Aulostomidae

12. Trumpetfish, *Aulostomus maculatus*

Pipefishes - Syngnathidae

13. Seahorses, *Hippocampus spp.*
14. Pipefishes, *Syngnathus spp.*

Flying gurnards - Dactylopteridae

15. Flying gurnard, *Dactylopterus volitans*

Scorpionfishes - Scorpaenidae

Sea basses - Serranidae

16. Rock hind, *Epinephelus adscensionis*
17. Graysby, *Epinephelus cruentatus*
18. Yellowedge grouper, *Epinephelus flavolimbatus*
19. Coney, *Epinephelus fulvus*
20. Red hind, *Epinephelus guttatus*
21. Goliath grouper, *Epinephelus itajara*
22. Red grouper, *Epinephelus morio*

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

23. Misty grouper, *Epinephelus mystacinus*
 24. Nassau grouper, *Epinephelus striatus*
 25. Butter hamlet, *Hypoplectus unicolor*
 26. Swissguard basslet, *Liopropoma rubre*
 27. Yellowfin grouper, *Mycteroperca venenosa*
 28. Tiger grouper, *Mycteroperca tigris*
 29. Creole-fish, *Paranthias furcifer*
 30. Greater soapfish, *Rypticus saponaceus*
 31. Orangeback bass, *Serranus annularis*
 32. Lantern bass, *Serranus baldwini*
 33. Tobacconfish, *Serranus tabacarius*
 34. Harlequin bass, *Serranus tigrinus*
 35. Chalk bass, *Serranus tortugarum*
- Basslets - Grammatidae
36. Royal gramma, *Grama loreto*
- Bigeyes - Priacanthidae
37. Bigeye, *Priacanthus arenatus*
 38. Glasseye snapper, *Priacanthus cruentatus*
- Cardinalfishes - Apogonidae
39. Flamefish, *Apogon maculatus*
 40. Conchfish, *Astrapogon stellatus*
- Tilefishes - Malacanthidae
41. Blackline tilefish, *Caulolatilus cyanops*
 42. Sand tilefish, *Malacanthus plumieri*
- Jacks - Carangidae
43. Yellow jack, *Caranx bartholomaei*
 44. Blue runner, *Caranx crysos*
 45. Horse-eye jack, *Caranx latus*
 46. Black jack, *Caranx lugubris*
 47. Bar jack, *Caranx ruber*
 48. Greater amberjack, *Seriola dumerili*
 49. Almaco jack, *Seriola rivoliana*
- Snappers - Lutjanidae
50. Black snapper, *Apsilus dentatus*

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

51.	Queen snapper, <i>Etelis oculatus</i>
52.	Mutton snapper, <i>Lutjanus analis</i>
53.	Schoolmaster, <i>Lutjanus apodus</i>
54.	Blackfin snapper, <i>Lutjanus buccanella</i>
55.	Gray snapper, <i>Lutjanus griseus</i>
56.	Dog snapper, <i>Lutjanus jocu</i>
57.	Mahogany snapper, <i>Lutjanus mahogoni</i>
58.	Lane snapper, <i>Lutjanus synagris</i>
59.	Silk snapper, <i>Lutjanus vivanus</i>
60.	Yellowtail snapper, <i>Ocyurus chrysurus</i>
61.	Wenchman, <i>Pristipomoides aquilonaris</i>
62.	Vermilion snapper, <i>Rhomboplites aurorubens</i>
Grunts - Haemulidae	
63.	Porkfish, <i>Anisotremus virginicus</i>
64.	Margate, <i>Haemulon album</i>
65.	Tomtate, <i>Haemulon aurolineatum</i>
Grunts - Haemulidae (cont.)	
66.	French grunt, <i>Haemulon flavolineatum</i>
67.	White grunt, <i>Haemulon plumieri</i>
68.	Bluestriped grunt, <i>Haemulon sciurus</i>
Porgies - Sparidae	
69.	Sea bream, <i>Archosargus rhomboidalis</i>
70.	Jolthead porgy, <i>Calamus bajonado</i>
71.	Sheepshead porgy, <i>Calamus penna</i>
72.	Pluma, <i>Calamus pennatula</i>
Drums - Sciaenidae	
73.	High-hat, <i>Equetus acuminatus</i>
74.	Jackknife-fish, <i>Equetus lanceolatus</i>
75.	Spotted drum, <i>Equetus punctatus</i>
Goatfishes - Mullidae	
76.	Yellow goatfish, <i>Mulloidichthys martinicus</i>
77.	Spotted goatfish, <i>Pseudupeneus maculatus</i>
Spadefishes - Ehippidae	
78.	Atlantic spadefish, <i>Chaetodipterus faber</i>

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

Butterflyfishes - Chaetodontidae

79. Longsnout butterflyfish, *Chaetodon aculeatus*
80. Foureye butterflyfish, *Chaetodon capistratus*
81. Spotfin butterflyfish, *Chaetodon ocellatus*
82. Banded butterflyfish, *Chaetodon striatus*

Angelfishes - Pomacanthidae

83. Cherubfish, *Centropyge argi*
84. Queen angelfish, *Holacanthus ciliaris*
85. Rock beauty, *Holacanthus tricolor*
86. Gray angelfish, *Pomacanthus arcuatus*
87. French angelfish, *Pomacanthus paru*

Damselfishes - Pomacentridae

88. Sergeant major, *Abudefduf saxatilis*
89. Blue chromis, *Chromis cyaneus*
90. Sunshinefish, *Chromos insolatus*
91. Yellowtail damselfish, *Microspathodon chrysurus*
92. Dusky damselfish, *Pomacentrus fuscus*
93. Beaugregory, *Pomacentrus leucostictus*
94. Bicolor damselfish, *Pomacentrus partitus*
95. Threespot damselfish, *Pomacentrus planifrons*

Hawkfishes - Cirrhitidae

96. Redspotted hawkfish, *Amblycirrhitus pinos*

Wrasses - Labridae

97. Spanish hogfish, *Bodianus rufus*
98. Creole wrasse, *Clepticus parrai*
99. Yellowcheek wrasse, *Halichoeres cyanocephalus*
100. Yellowhead wrasse, *Halichoeres garnoti*
101. Clown wrasse, *Halichoeres maculipinna*
102. Puddingwife, *Halichoeres radiatus*
103. Pearly razorfish, *Hemipteronotus novacula*
104. Green razorfish, *Hemipteronotus splendens*
105. Hogfish, *Lachnolaimus maximus*
106. Bluehead wrasse, *Thalassoma bifasciatum*

Parrotfishes – Scaridae

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

107.	Midnight parrotfish, <i>Scarus coelestinus</i>
108.	Blue parrotfish, <i>Scarus coeruleus</i>
109.	Striped parrotfish, <i>Scarus croicensis</i>
110.	Rainbow parrotfish, <i>Scarus guacamaia</i>
111.	Princess parrotfish, <i>Scarus taeniopterus</i>
112.	Queen parrotfish, <i>Scarus vetula</i>
Parrotfishes - Scaridae (cont.)	
113.	Redband parrotfish, <i>Sparisoma aurofrenatum</i>
114.	Redtail parrotfish, <i>Sparisoma chrysopteron</i>
115.	Redfin parrotfish, <i>Sparisoma rubripinne</i>
116.	Stoplight parrotfish, <i>Sparisoma viride</i>
Jawfishes - Opistognathidae	
117.	Yellowhead jawfish, <i>Opistognathus aurifrons</i>
118.	Dusky jawfish, <i>Opistognathus whitehursti</i>
Combtooth blennies - Blenniidae	
119.	Redlip blenny, <i>Ophioblennius atlanticus</i>
Gobies - Gobiidae	
120.	Neon goby, <i>Gobiosoma oceanops</i>
121.	Rusty goby, <i>Priolepis hipoliti</i>
Surgeonfishes - Acanthuridae	
122.	Ocean surgeonfish, <i>Acanthurus bahianus</i>
123.	Doctorfish, <i>Acanthurus chirurgus</i>
124.	Blue tang, <i>Acanthurus coeruleus</i>
Lefteye flounders - Bothidae	
125.	Peacock flounder, <i>Bothus lunatus</i>
Soles - Soleidae	
126.	Caribbean tonguefish, <i>Symphurus arawak</i>
Leatherjackets - Balistidae	
127.	Scrawled filefish, <i>Aluterus scriptus</i>
128.	Queen triggerfish, <i>Balistes vetula</i>
129.	Whitespotted filefish, <i>Cantherhines macrocerus</i>
130.	Ocean triggerfish, <i>Canthidermis sufflamen</i>
131.	Black durgon, <i>Melichthys niger</i>
132.	Sargassum triggerfish, <i>Xanthichthys ringens</i>

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

Boxfishes - Ostraciidae

- 133. Spotted trunkfish, *Lactophrys bicaudalis*
- 134. Honeycomb cowfish, *Lactophrys polygonia*
- 135. Scrawled cowfish, *Lactophrys quadricornis*
- 136. Trunkfish, *Lactophrys trigonus*
- 137. Smooth trunkfish, *Lactophrys triqueter*

Puffers - Tetraodontidae

- 138. Sharpnose puffer, *Canthigaster rostrata*
- 139. Porcupinefish, *Diodon hystrix*

Table 2.4. List of species or species groups in the Coral FMP.

PHYLUM PORIFERA

Class Demospongiae

Niphates digitalis

N. erecta

Aphimedon compressa

Spinosella polycifera

S. vaginalis

Geodia neptuni

Chondrilla nacula

Cynachirella alloclada

Tethya crypta

Myriastras sp.

Haliclona

PHYLUM CNIDARIA

Class Hydrozoa

Order Hydroida

Order Milleporina

Millepora spp.

Order Stylasterina

Stylaster roseus

Class Anthozoa

Order Antipatharia

Antipathes spp.

Stichopathes spp.

Subclass Octocorallia

Order Alcyonacea

Family Anthothelidae

Erythropodium caribaeorum

Iciligorgia schrammi

Family Briareidae

Briareum asbestinum

Family Telestacea

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Telesto riisei
Order Gorgonacea
Family Gorgoniidae
Gorgonia mariae
G. ventalina
G. flabellum
Pseudopterogorgia acerosa
P. americana
P. bipinnata
P. rigida
P. albatrossae
Pterogorgia anceps
P. citrina
Family Plexauridae
Eunicea mammosa
E. succinea
E. laxispica
E. fusca
E. laciniata
E. touneforti
E. clavigera
E. knighti
E. calyculata
Muricea atlantica
M. muricata
M. pinnata
M. laxa
M. elongata
Muriceopsis sp.
M. sulphurea
M. flavida
Plexaura flexuosa
P. homomalla
Pseudoplexaura porosa

Table 2.4. List of species or species groups in the Coral FMP (Continued)

P. flagellosa
P. wagnaari
P. crucis
Plexaurella dichotoma
P. nutans
P. grandiflora
P. grisea
P. fusifera
 Family Ellisellidae
Ellisella spp.
 Order Scleractinia
 Family Astrocoeniidae
Stephanocoenia michelinii
 Family Pocilloporidae
Madracis decactis
M. mirabilis
 Family Acroporidae
Acropora palmata
A. cervicornis
A. prolifera
 Family Agaricidae
Agaricia agaricites
A. fragilis
A. tenuifolia
A. lamarcki
Leptoseris cucullata
 Family Siderastreidae
Siderastrea siderea
S. radians
 Family Poritidae
Porites astreoides
P. porites
P. branneri
P. divaricata

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Family Faviidae

Favia fragum

Diploria clivosa

D. strigosa

D. labyrinthiformis

Manicina areolata

M. mayori

Colpophyllia natans

Cladocora arbuscula

Montastrea annularis

M. cavernosa

Solenastrea bournoni

Family Rhizangiidae

Phyllangia americana

Astrangia solitaria

Family Meandrinidae

Meandrina meandrites

Dichocoenia stokesi

D. stellaris

Dendrogyra cylindrus

Family Mussidae

Mussa angulosa

Scolymia lacera

S. cubensis

Isophyllia sinuosa

Isophyllastrea rigida

Mycetophyllia lamarckiana

M. aliciae

M. danae

M. ferox

Family Caryophyllidae

Eusmilia fastigiata

Tubastrea aurea

Family Oculinidae

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Oculina diffusa
Order Actiniaria
Condylactis gigantea
Bartholomea annulata
Hereractis lucida
Aiptasia tagetes
Lebrunia spp.
Stichodactyla helianthus
Order Zoanthidea
Zoanthus spp.
Order Corallimorpharian
Ricordia florida
Discosoma spp.
(formally Rhodactis)
Phylum Mollusca
Class Gastropoda
Order Mesogastropoda
Family Strombidae
Strombus spp. (except
Queen Conch (<i>S. gigas</i>)
Family Ovulidae
Cyphoma gibbosum
Family Ranellidae
Charonia tritonis
Order Neogastropoda
Family Olividae
Oliva reticularis
Order Sacoglossa
Family Elysiidae
Tridachia crispata
Class Bivalvia
Orden Limoida
Family Limidae

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Lima spp.

L. scabra

Order Ostreoida

Family Spondylidae

Spondylus americanus

Class Cephalopoda

Order Octopoda

Family Octopodidae

Octopus spp. (except
the Common Octopus
(O. vulgaris))

Phylum Annelida

Class Polychaeta

Family Sabellidae

Sabellastarte magnifica

Sabellastarte spp.

Family Serpulidae

Spirobranchus giganteus

Phylum Arthropoda

Sub-phylum Crustacea

Order Decapoda

Family Stenopodidae

Stenopus hispidus

S. scutellatus

Family Hippolytidae

Lysmata spp.

Thor amboinensis

Family Palaemonidae

Periclimenes spp.

Family Alpheidae

Alpheaus armatus

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Family Diogenidae

Paguristes spp.

P. cadenati

Family Majidae

Mithrax spp.

M. sculptus

M. cinctimanus

Stenorhynchus seticornis

Family Grapsidae

Percnon gibbesi

Family Squillidae

Lysiosquilla spp.

Gonodactylus spp.

Phylum Bryozoa (Ectoprocta)

Phylum Echinodermata

Class Stellerioidea

Oreaster reticulatus

Linckia guildingii

Ophidiaster guildingii

Astropecten spp.

Ophiocoma spp.

Ophioderma spp.

Ophioderma rubicundum

Astrophyton muricatum

Davidaster spp.

Nemaster spp.

Analcidometra armata

Class Echinoidea

Diadema antillarum

Echinometra spp.

Lytechinus spp.

Eucidaris tribuloides

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Tripneustes ventricosus

Class Holothuroidea

Holothuria spp.

Phylum Chordata

Subphylum Urochordata

Phylum Chlorophyta

Halimeda spp.

Penicillus spp.

Caulerpa spp.

Ventricaria ventricosa

Udotea spp.

Phylum Rhodophyta

Phylum Angiospermae

Thalassia testudium

Syringodium filiforme

Halophila spp.

Halodule wrightii

Ruppia maritima

Table 2.5. Summary of habitat utilization by life history stage for species in the Spiny Lobster FMP. Habitats identified represent EFH under Alternative 6 for each species and life stage in the Spiny Lobster FMP.

Estuarine Habitat

SPECIES_SCI	Adults	Early juveniles	Late juveniles
Panulirus argus	Seagrasses	Benthic algae	Mangrove, Seagrasses

Marine Habitat

SPECIES_SCI	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Panulirus argus	Hard bottoms, Reef, Seagrasses	Benthic algae, Hard bottoms, Reef	Reef	Pelagic	Mangrove, Reef, Seagrasses	Benthic algae, Seagrasses	Reef
Panulirus guttatus	Reef	Reef	Reef	Pelagic	Reef	Reef	Reef
Panulirus laevis	Reef						

Table 2.6. Summary of habitat utilization by life history stage for species in the Queen Conch FMP. Habitats identified by represent EFH under Alternative 6 for each species and life stage in the Queen Conch FMP.

Estuarine Habitat

SPECIES_SCI	Eggs
Cassis flammea	Seagrasses

Marine Habitat

SPECIES_SCI	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Spawning adults
Astrea tuber	Reef	Reef			Reef	
Cassis flammea	Seagrasses					
Cassis madagascarensis	Seagrasses	Seagrasses			Seagrasses	
Cassis tuberosa	Hard bottoms, Seagrasses	Seagrasses			Seagrasses	
Charonia variegata	Hard bottoms, Sand/Shell bottoms					
Cittarium pica	Hard bottoms	Hard bottoms			Hard bottoms	
Fasciolaria tulipa	Hard bottoms, Reef, Seagrasses					
Strombus costatus	Benthic algae, Hard bottoms, Seagrasses	Benthic algae, Seagrasses			Benthic algae, Seagrasses	
Strombus gallus	Benthic algae, Seagrasses					
Strombus gigas	Benthic algae, Hard bottoms, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Sand/Shell bottoms	Sand/Shell bottoms	Pelagic	Sand/Shell bottoms, Seagrasses	Sand/Shell bottoms, Seagrasses

Table 2.6. Summary of habitat utilization by life history stage for species in the Queen Conch FMP (Marine continued)

SPECIES_SCI	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Spawning adults
<i>Strombus pugilis</i>	Benthic algae, Hard bottoms, Seagrasses	Benthic algae, Seagrasses			Benthic algae, Seagrasses	
<i>Strombus raninus</i>	Seagrasses					
<i>Vasum muricatum</i>	Benthic algae, Seagrasses					

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP. Habitats identified represent EFH under Alternative 6 for each species and life stage in the Reef Fish FMP.

Estuarine

SPECIES_ SCI	Adults	Early juveniles	Larvae	Late juveniles	Postlarvae	Spawning adults
Abudefduf saxatilis	Mangrove					
Acanthurus bahianus	Mangrove					
Acanthurus chirurgus	Mangrove					
Acanthurus coeruleus	Mangrove					
Anisotremus virginicus	Mangrove	Mangrove		Mangrove, Seagrasses		
Archosargus rhomboidalis	Mangrove, Seagrasses	Seagrasses		Mangrove, Seagrasses	Seagrasses	
Bodianus rufus	Mangrove					
Canthigaster rostrata	Seagrasses	Seagrasses		Seagrasses		
Caranx bartholomaei	Seagrasses			Seagrasses		
Caranx latus	Mangrove, Seagrasses					
Caranx ruber	Mangrove, Seagrasses					
Chaetodon capistratus	Mangrove, Seagrasses			Mangrove, Seagrasses		
Chaetodon striatus	Mangrove, Seagrasses					
Diodon hystrix	Seagrasses			Seagrasses		
Epinephelus cruentatus				Mangrove, Seagrasses		
Epinephelus guttatus				Mangrove, Seagrasses		
Epinephelus itajara	Artificial structures	Mangrove, Seagrasses	Man- grove	Mangrove, Seagrasses	Mangrove	
Epinephelus morio		Seagrasses				
Epinephelus striatus				Mangrove, Seagrasses		
Equetus acuminatus	Seagrasses					

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Estuarine continued)

SPECIES_ SCI	Adults	Early juveniles	Larvae	Late juveniles	Postlarvae	Spawning adults
Haemulon album				Mangrove		
Haemulon aurolineatum	Mangrove, Seagrasses	Mangrove, Seagrasses		Mangrove, Seagrasses		
Haemulon flavolineatum	Mangrove, Seagrasses	Mangrove, Seagrasses		Mangrove, Seagrasses	Artificial reef, Seagrasses	
Haemulon plumieri	Mangrove, Seagrasses	Mangrove, Seagrasses		Mangrove, Seagrasses	Seagrasses	
Haemulon sciurus	Mangrove, Seagrasses	Mangrove, Seagrasses		Mangrove, Seagrasses	Seagrasses	
Halichoeres garnoti	Mangrove					
Hippocampus spp.	Seagrasses	Seagrasses		Seagrasses		
Holocentrus rufus	Mangrove					
Lachnolaimus maximus		Seagrasses		Seagrasses		
Lactophrys bicaudalis	Seagrasses					
Lactophrys quadricornis	Seagrasses					
Lactophrys trigonus	Seagrasses					
Lutjanus analis	Mangrove, Seagrasses	Emergent marshes, Mangrove, Seagrasses		Emergent marshes, Mangrove, Seagrasses		
Lutjanus apodus	Artificial structures, Mangrove, Seagrasses	Artificial structures, Mangrove, Seagrasses		Artificial structures, Emergent marshes, Mangrove, Seagrasses		
Lutjanus griseus	Mangrove, Sand/Shell bottoms, Seagrasses	Emergent marshes, Mangrove, Seagrasses		Emergent marshes, Mangrove, Seagrasses	Seagrasses	

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Estuarine continued)

SPECIES_ SCI	Adults	Early juveniles	Larvae	Late juveniles	Postlarvae	Spawning adults
Lutjanus jocu	Artificial structures, Mangrove, Seagrasses	Mangrove, Seagrasses		Artificial structures, Mangrove, Seagrasses		
Lutjanus mahogoni		Seagrasses		Mangrove, Seagrasses		
Lutjanus synagris	Mangrove, Seagrasses, Soft bottoms	Mangrove, Sand/Shell bottoms, Seagrasses , Soft bottoms		Mangrove, Sand/Shell bottoms, Seagrasses, Soft bottoms	Seagrasses	
Microspathod on chrysurus	Mangrove					
Mulloidichthy s martinicus	Mangrove					
Mycteroperca venenosa		Seagrasses		Seagrasses		
Ocyurus chrysurus	Artificial structures, Mangrove, Seagrasses	Artificial structures, Mangrove, Sand/Shell bottoms, Seagrasses , Soft bottoms		Artificial structures, Mangrove, Seagrasses	Seagrasses	
Pomacanthus arcuatus	Mangrove, Seagrasses					
Pomacentrus leucostictus	Mangrove					
Pomacentrus partitus	Mangrove					
Pseudupeneu s maculatus	Seagrasses					
Rypticus saponaceus				Mangrove, Seagrasses		
Scarus croicensis	Mangrove, Seagrasses					
Scarus guacamaia	Mangrove					
Sparisoma chrysopterum	Mangrove, Seagrasses					

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Estuarine continued)

SPECIES_SCI	Adults	Early juveniles	Larvae	Late juveniles	Postlarvae	Spawning adults
<i>Sparisoma viride</i>	Mangrove					
<i>Syngnathus</i> spp.	Seagrasses	Seagrasses		Seagrasses		
<i>Thalassoma bifasciatum</i>	Mangrove					

Marine

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
<i>Abudefduf saxatilis</i>	Artificial reef, Mangrove, Reef	Artificial reef, Mangrove, Reef			Artificial reef, Mangrove, Reef	Mangrove, Reef	
<i>Acanthurus bahianus</i>	Artificial reef, Mangrove, Reef, Rubble						
<i>Acanthurus chirurgus</i>	Mangrove, Reef						
<i>Acanthurus coeruleus</i>	Mangrove, Reef						
<i>Aluterus scriptus</i>	Reef						
<i>Amblycirrhitus pinos</i>	Reef						
<i>Anisotremus virginicus</i>	Hard bottoms, Reef, Rubble	Hard bottoms, Mangrove, Reef, Rubble			Mangrove, Reef, Seagrasses	Hard bottoms, Reef, Rubble	
<i>Antennarius</i> spp.	Hard bottoms, Reef						
<i>Apogon maculatus</i>	Reef						
<i>Apsilus dentatus</i>	Hard bottoms, Reef						

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Archosargus rhomboidalis	Mangrove, Reef, Seagrasses	Seagrasses			Mangrove, Reef, Seagrasses	Seagrasses	
Astrapogon stellatus	Rubble, Sand/Shell bottoms, Seagrasses						
Aulostomus maculatus	Reef						
Balistes vetula	Reef, Rubble						
Bodianus rufus	Artificial reef, Hard bottoms, Mangrove, Reef				Artificial reef, Hard bottoms, Mangrove		
Bothus lunatus	Reef, Rubble, Soft bottoms				Soft bottoms		
Calamus bajonado	Reef, Sand/Shell bottoms, Seagrasses	Reef, Sand/Shell bottoms, Seagrasses			Reef, Sand/Shell bottoms, Seagrasses		
Calamus penna	Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses						
Calamus pennatula	Reef, Rubble						
Cantherhines macrocerus	Reef						
Canthidermis sufflamen	Reef						Reef
Canthigaster rostrata	Reef, Rubble, Seagrasses	Reef, Rubble, Seagrasses			Reef, Rubble, Seagrasses		
Caranx bartholomaei	Reef, Seagrasses				Reef, Seagrasses		
Caranx crysos	Reef, Rubble				Reef, Rubble		

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
<i>Caranx latus</i>	Mangrove, Reef, Seagrasses				Reef		
<i>Caranx lugubris</i>	Pelagic, Reef						
<i>Caranx ruber</i>	Mangrove, Reef, Rubble, Seagrasses				Reef, Rubble		
<i>Caulolatilus cyanops</i>	Hard bottoms, Sand/Shell bottoms, Soft bottoms		Pelagic	Pelagic			
<i>Centropyge argi</i>	Reef						
<i>Cephalopholis fulva</i>	Artificial reef, Hard bottoms, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Artificial reef, Benthic algae			Reef		Hard bottoms, Reef
<i>Chaetodipterus faber</i>	Reef						
<i>Chaetodon aculeatus</i>	Reef, Rubble		Reef				Reef
<i>Chaetodon capistratus</i>	Mangrove, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Artificial reef, Benthic algae, Reef, Seagrasses			Artificial reef, Mangrove, Reef, Seagrasses		Reef
<i>Chaetodon ocellatus</i>	Reef						
<i>Chaetodon striatus</i>	Mangrove, Reef, Rubble, Sand/Shell bottoms, Seagrasses		Pelagic	Pelagic			Reef
<i>Chromis cyaneus</i>	Reef	Reef			Reef	Reef	

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Chromos insolatus	Reef						
Creole wrasse	Reef						
Dactylopterus volitans	Sand/Shell bottoms, Seagrasses, Soft bottoms	Sand/Shell bottoms, Seagrasses, Soft bottoms			Sand/Shell bottoms, Seagrasses, Soft bottoms		
Diodon hystix	Hard bottoms, Reef, Seagrasses				Hard bottoms, Reef, Seagrasses		
Echidna catenata	Reef						
Epinephelus adscensionis	Hard bottoms, Reef	Artificial reef	Pelagic	Pelagic	Artificial reef		Hard bottoms, Reef
Epinephelus cruentatus	Reef, Rubble				Mangrove, Reef, Seagrasses		Reef
Epinephelus flavolimbatus	Hard bottoms		Pelagic	Pelagic	Hard bottoms		
Epinephelus guttatus	Hard bottoms, Reef, Rubble, Sand/Shell bottoms	Artificial reef, Rubble, Sand/Shell bottoms	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Reef	Reef
Epinephelus itajara	Artificial reef, Hard bottoms, Reef, Shoals/Banks	Mangrove, Reef, Seagrasses	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Seagrasses	Mangrove	Artificial reef, Hard bottoms, Reef
Epinephelus morio	Artificial reef, Hard bottoms, Reef	Hard bottoms, Reef, Seagrasses	Pelagic	Pelagic	Hard bottoms, Reef		
Epinephelus mystacinus	Hard bottoms		Pelagic	Pelagic			Hard bottoms, Reef

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
<i>Epinephelus striatus</i>	Artificial reef, Reef	Benthic algae, Reef, Seagrasses			Artificial reef, Mangrove, Reef, Seagrasses		Reef
<i>Equetus acuminatus</i>	Reef, Rubble, Seagrasses						
<i>Equetus lanceolatus</i>	Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses	Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses			Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses		
<i>Equetus punctatus</i>	Reef						
<i>Etelis oculatus</i>	Bare sand, Hard bottoms		Pelagic	Pelagic	Hard bottoms		
<i>Gobiosoma oceanops</i>	Reef						
<i>Gramma loreto</i>	Reef						
<i>Gymnothorax funebris</i>	Reef						
<i>Gymnothorax miliaris</i>	Reef						
<i>Haemulon album</i>	Hard bottoms, Reef				Hard bottoms, Mangrove, Reef		
<i>Haemulon aurolineatum</i>	Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Reef, Rubble, Seagrasses			Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Reef, Rubble, Seagrasses	
<i>Haemulon flavolineatum</i>	Artificial reef, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Benthic algae, Mangrove, Reef, Rubble, Seagrasses		Pelagic	Artificial reef, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Benthic algae, Reef, Rubble, Seagrasses	

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Haemulon plumieri	Artificial reef, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Mangrove, Reef, Rubble, Seagrasses			Artificial reef, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Reef, Rubble, Seagrasses	Reef
Haemulon sciurus	Mangrove, Reef, Rubble, Seagrasses	Mangrove, Reef, Rubble, Seagrasses			Mangrove, Reef, Rubble, Seagrasses	Reef, Rubble, Seagrasses	
Halichoeres cyanocephalus	Reef						
Halichoeres garnoti	Artificial reef, Mangrove, Reef						
Halichoeres maculipinna	Reef, Rubble						
Halichoeres radiatus	Reef, Rubble						
Hemipteronotus novacula	Rubble						
Hemipteronotus splendens	Rubble						
Hippocampus spp.	Hard bottoms, Seagrasses	Hard bottoms, Seagrasses			Hard bottoms, Seagrasses		
Holacanthus ciliaris	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Reef		
Holacanthus tricolor	Reef						
Holocentrus ascensionis	Reef						
Holocentrus rufus	Artificial reef, Mangrove, Reef						
Honeycomb cowfish	Reef, Rubble						
Lachnolaimus maximus	Artificial reef, Hard bottoms, Reef	Artificial reef, Seagrasses	Reef		Artificial reef, Seagrasses		Hard bottoms, Reef

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Lactophrys bicaudalis	Seagrasses						
Lactophrys quadricornis	Seagrasses						
Lactophrys trigonus	Seagrasses						
Lactophrys triqueter	Reef, Rubble						
Lutjanus analis	Benthic algae, Mangrove, Reef, Sand/Shell bottoms, Seagrasses	Mangrove, Reef, Seagrasses	Reef	Reef	Mangrove, Reef, Seagrasses	Reef	Reef, Shoals/Banks
Lutjanus apodus	Hard bottoms, Mangrove, Reef, Seagrasses	Hard bottoms, Mangrove, Reef, Seagrasses	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Seagrasses		Reef
Lutjanus buccanella	Hard bottoms, Reef, Rubble	Artificial reef, Hard bottoms, Reef, Rubble	Pelagic		Hard bottoms, Reef, Rubble		Hard bottoms
Lutjanus griseus	Mangrove, Reef, Seagrasses	Mangrove, Reef, Seagrasses	Pelagic, Reef	Pelagic, Reef	Mangrove, Reef, Seagrasses	Seagrasses	Reef, Shoals/Banks
Lutjanus jocu	Hard bottoms, Mangrove, Reef, Seagrasses	Mangrove, Seagrasses	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Seagrasses		Reef
Lutjanus mahogoni	Artificial reef, Hard bottoms, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Artificial reef, Benthic algae, Hard bottoms, Reef, Rubble, Seagrasses	Pelagic	Pelagic	Artificial reef, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses		

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Lutjanus synagris	Artificial reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses, Shoals/Banks, Soft bottoms	Artificial reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses, Soft bottoms	Pelagic		Artificial reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses, Soft bottoms	Hard bottoms, Reef, Seagrasses	Sand/Shell bottoms
Lutjanus vivanus	Hard bottoms, Rubble, Sand/Shell bottoms, Soft bottoms						
Malacanthus plumieri	Rubble						
Melichthys niger	Reef, Rubble				Reef		
Microspathodon chrysurus	Mangrove, Reef	Reef			Reef	Reef	
Mulloidichthys martinicus	Mangrove, Reef, Rubble						
Mycteroperca tigris	Hard bottoms, Reef						Reef
Mycteroperca venenosa	Hard bottoms, Reef	Seagrasses			Hard bottoms, Reef, Seagrasses		Hard bottoms
Myrichthys oculatus	Reef, Sand/Shell bottoms, Seagrasses, Soft bottoms						
Myripristis jacobus	Reef						

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Ocyurus chrysurus	Artificial reef, Artificial structures, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses, Shoals/Banks	Artificial reef, Artificial structures, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses, Soft bottoms	Pelagic		Artificial reef, Artificial structures, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Hard bottoms, Reef, Rubble, Seagrasses	
Ogcocephalus spp.	Hard bottoms, Reef, Seagrasses						
Ophioblennius atlanticus	Reef				Reef		
Opistognathus aurifrons	Rubble						
Opistognathus whitehursti	Rubble						
Paranthias furcifer	Reef						Reef
Pomacanthus arcuatus	Mangrove, Reef, Rubble, Seagrasses				Reef, Rubble		
Pomacanthus paru	Reef				Reef		
Pomacentrus fuscus	Reef						Reef
Pomacentrus leucostictus	Mangrove, Reef	Reef			Reef	Reef	Reef
Pomacentrus partitus	Artificial reef, Mangrove, Reef, Rubble	Reef, Rubble			Reef, Rubble		
Pomacentrus planifrons	Reef	Reef			Reef		Reef
Priacanthus arenatus	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Reef		

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Priacanthus cruentatus	Reef						
Pristipomoides macrophthalmus	Hard bottoms, Rubble, Sand/Shell bottoms		Pelagic	Pelagic			Sand/Shell bottoms
Pseudupeneus maculatus	Reef, Rubble, Seagrasses						
Rhomboplites aurubens	Artificial reef, Hard bottoms, Reef	Artificial reef, Hard bottoms, Reef			Artificial reef, Hard bottoms, Reef		
Rypticus saponaceus	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Mangrove, Reef, Seagrasses		
Scarus coelestinus	Reef						
Scarus coeruleus	Hard bottoms, Reef, Seagrasses	Hard bottoms, Reef, Seagrasses			Hard bottoms, Reef, Seagrasses		
Scarus croicensis	Artificial reef, Mangrove, Reef, Rubble, Seagrasses						
Scarus guacamaia	Mangrove, Reef						
Scarus taeniopterus	Reef						
Scarus vetula	Reef						
Scorpaenidae nei	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Reef		
Seriola dumerili	Pelagic, Reef	Drift Algae	Pelagic	Pelagic	Drift Algae	Pelagic	Pelagic
Seriola rivoliana	Pelagic	Drift Algae	Pelagic		Drift Algae		Pelagic

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Marine continued)

SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
<i>Serranus annularis</i>	Hard bottoms, Reef						
<i>Serranus baldwini</i>	Rubble	Artificial reef					
<i>Serranus tabacarius</i>	Reef, Rubble	Artificial reef					
<i>Serranus tigrinus</i>	Hard bottoms, Reef	Artificial reef					
<i>Serranus tortugarum</i>	Rubble						
<i>Sparisoma aurofrenatum</i>	Reef						
<i>Sparisoma chrysotermum</i>	Artificial reef, Mangrove, Reef, Seagrasses						
<i>Sparisoma rubripinne</i>	Reef						
<i>Sparisoma viride</i>	Artificial reef, Mangrove, Reef						
<i>Syngnathus spp.</i>	Seagrasses	Seagrasses			Seagrasses		
<i>Synodus intermedius</i>	Rubble						
<i>Thalassoma bifasciatum</i>	Artificial reef, Mangrove, Reef, Rubble	Reef, Rubble			Reef, Rubble	Reef, Rubble	Reef
<i>Xanthichthys ringens</i>	Reef						

Table 2.8. Habitat use by species/life stages of Caribbean FMP species

Estuarine: Reef Fish FMP

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Abudefduf saxatilis				Adults			
Acanthurus bahianus				Adults			
Acanthurus chirurgus				Adults			
Acanthurus coeruleus				Adults			
Anisotremus virginicus				Adults, Early juveniles, Late juveniles		Late juveniles	
Archosargus rhomboidalis				Adults, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarvae	
Bodianus rufus				Adults			
Canthigaster rostrata						Adults, Early juveniles, Late juveniles	

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Estuarine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Caranx bartholomaei						Adults, Late juveniles	
Caranx latus				Adults		Adults	
Caranx ruber				Adults		Adults	
Chaetodon capistratus				Adults, Late juveniles		Adults, Late juveniles	
Chaetodon striatus				Adults		Adults	
Diodon hystrix						Adults, Late juveniles	
Epinephelus cruentatus				Late juveniles		Late juveniles	
Epinephelus guttatus				Late juveniles		Late juveniles	
Epinephelus itajara		Adults		Early juveniles, Larvae, Late juveniles, Postlarvae		Early juveniles, Late juveniles	
Epinephelus morio						Early juveniles	
Epinephelus striatus				Late juveniles		Late juveniles	
Equetus acuminatus						Adults	
Haemulon album				Late juveniles			

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Estuarine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Haemulon aurolineatum				Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	
Haemulon flavolineatum	Postlarvae			Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarvae	
Haemulon plumieri				Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarvae	
Haemulon sciurus				Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarvae	
Halichoeres garnoti				Adults			
Hippocampus spp.						Adults, Early juveniles, Late juveniles	
Holocentrus rufus				Adults			

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Estuarine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Lachnolaimus maximus						Early juveniles, Late juveniles	
Lactophrys bicaudalis						Adults	
Lactophrys quadricornis						Adults	
Lactophrys trigonus						Adults	
Lutjanus analis			Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	
Lutjanus apodus		Adults, Early juveniles, Late juveniles	Late juveniles	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	
Lutjanus griseus			Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles	Adults	Adults, Early juveniles, Late juveniles, Postlarvae	
Lutjanus jocu		Adults, Late juveniles		Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Estuarine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Lutjanus mahogoni				Late juveniles		Early juveniles, Late juveniles	
Lutjanus synagris				Adults, Early juveniles, Late juveniles	Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles, Postlarvae	Adults, Early juveniles, Late juveniles
Microspathodon chrysurus				Adults			
Mulloidichthys martinicus				Adults			
Mycteroperca venenosa						Early juveniles, Late juveniles	
Ocyurus chrysurus		Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Early juveniles	Adults, Early juveniles, Late juveniles, Postlarvae	Early juveniles
Pomacanthus arcuatus				Adults		Adults	
Pomacentrus leucostictus				Adults			
Pomacentrus partitus				Adults			

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Estuarine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Pseudupeneus maculatus						Adults	
Rypticus saponaceus				Late juveniles		Late juveniles	
Scarus croicensis				Adults		Adults	
Scarus guacamaia				Adults			
Sparisoma chrysotermum				Adults		Adults	
Sparisoma viride				Adults			
Syngnathus spp.						Adults, Early juveniles, Late juveniles	
Thalassoma bifasciatum				Adults			

Estuarine: Spiny Lobster FMP

SPECIES_SCI	Benthic algae	Mangrove	Seagrasses
Panulirus argus	Early juveniles	Late juveniles	Adults, Late juveniles

Estuarine: Queen Conch FMP

SPECIES_SCI	Seagrasses
Cassis flammea	Eggs

Table 2.8. Habitat use by species/life stages of Caribbean FMP species

Marine: Reef Fish FMP

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Abudefduf saxatilis	Adults, Early juveniles, Late juveniles						Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.					
Acanthurus bahianus	Adults						Adults		Adults	Adults				
Acanthurus chirurgus							Adults		Adults					
Acanthurus coeruleus							Adults		Adults					
Aluterus scriptus									Adults					
Amblycirrhitus pinos									Adults					
Anisotremus virginicus						Adults, Early juveniles, Postlarv.	Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Postlarv.		Late juveniles		
Antennarius spp.						Adults			Adults					
Apogon maculatus									Adults					
Apsilus dentatus						Adults			Adults					
Archosargus rhomboidalis							Adults, Late juveniles		Adults, Late juveniles			Adults, Early juveniles, Late juveniles, Postlarv.		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Astrapogon stellatus										Adults	Adults	Adults		
Aulostomus maculatus									Adults					
Balistes vetula									Adults	Adults				
Bodianus rufus	Adults, Late juveniles					Adults, Late juveniles	Adults, Late juveniles		Adults					
Bothus lunatus									Adults	Adults				Adults, Late juveniles
Calamus bajonado									Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		
Calamus penna						Adults			Adults		Adults	Adults		
Calamus pennatula									Adults	Adults				
Cantherhines macrocerus									Adults					
Canthidermis sufflamen									Adults, Spawning adults					
Canthigaster rostrata									Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles		
Caranx bartholomaei									Adults, Late juveniles			Adults, Late juveniles		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Caranx crysos									Adults, Late juveniles	Adults, Late juveniles				
Caranx latus							Adults		Adults, Late juveniles			Adults		
Caranx lugubris								Adults	Adults					
Caranx ruber							Adults		Adults, Late juveniles	Adults, Late juveniles		Adults		
Caulolatilus cyanops						Adults		Eggs, Larvae			Adults			Adults
Centropyge argi									Adults					
Cephalopholis fulva	Adults, Early juveniles			Early juveniles		Adults, Spawning adults			Adults, Late juveniles, Spawning adults	Adults	Adults	Adults		
Chaetodipterus faber									Adults					
Chaetodon aculeatus									Adults, Eggs, Spawning adults	Adults				
Chaetodon capistratus	Early juveniles, Late juveniles			Early juveniles			Adults, Late juveniles		Adults, Early juveniles, Late juveniles, Spawning adults	Adults	Adults	Adults, Early juveniles, Late juveniles		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Chaetodon ocellatus									Adults					
Chaetodon striatus							Adults	Eggs, Larvae	Adults, Spawning adults	Adults	Adults	Adults		
Chromis cyaneus									Adults, Early juveniles, Late juveniles, Postlarv.					
Chromis insolatus									Adults					
Creole wrasse									Adults					
Dactylopterus volitans											Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles
Diodon hystrix						Adults, Late juveniles			Adults, Late juveniles			Adults, Late juveniles		
Echidna catenata									Adults					
Epinephelus adscensionis	Early juveniles, Late juveniles					Adults, Spawning adults		Eggs, Larvae	Adults, Spawning adults					
Epinephelus cruentatus							Late juveniles		Adults, Late juveniles, Spawning adults	Adults		Late juveniles		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Epinephelus flavolimbatus						Adults, Late juveniles		Eggs, Larvae						
Epinephelus guttatus	Early juveniles					Adults, Late juveniles	Late juveniles	Eggs, Larvae	Adults, Late juveniles, Postlarv., Spawnin g adults	Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles	Late juveniles		
Epinephelus itajara	Adults, Spawnin g adults					Adults, Late juveniles, Spawnin g adults	Early juveniles, Late juveniles, Postlarv.	Eggs, Larvae	Adults, Early juveniles, Late juveniles, Spawnin g adults			Early juveniles, Late juveniles	Adults	
Epinephelus morio	Adults					Adults, Early juveniles, Late juveniles		Eggs, Larvae	Adults, Early juveniles, Late juveniles			Early juveniles		
Epinephelus mystacinus						Adults, Spawnin g adults		Eggs, Larvae	Spawnin g adults					
Epinephelus striatus	Adults, Late juveniles			Early juveniles			Late juveniles		Adults, Early juveniles, Late juveniles, Spawnin g adults			Early juveniles, Late juveniles		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
<i>Equetus acuminatus</i>									Adults	Adults		Adults		
<i>Equetus lanceolatus</i>						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		
<i>Equetus punctatus</i>									Adults					
<i>Etelis oculatus</i>			Adults			Adults, Late juveniles		Eggs, Larvae						
<i>Gobiosoma oceanops</i>									Adults					
<i>Grama loreto</i>									Adults					
<i>Gymnothorax funebris</i>									Adults					
<i>Gymnothorax miliaris</i>									Adults					
<i>Haemulon album</i>						Adults, Late juveniles	Late juveniles		Adults, Late juveniles					
<i>Haemulon aurolineatum</i>	Early juveniles, Postlarv.						Adults, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Haemulon flavolineatum	Adults, Early juveniles, Late juveniles, Postlarv.			Early juveniles, Postlarv.			Adults, Early juveniles, Late juveniles	Larvae	Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Haemulon plumieri	Adults, Early juveniles, Late juveniles, Postlarv.						Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarv., Spawning adults	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Haemulon sciurus							Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Halichoeres cyanocephalus									Adults					
Halichoeres garnoti	Adults						Adults		Adults					

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Halichoeres maculipinna									Adults	Adults				
Halichoeres radiatus									Adults	Adults				
Hemipteronotus novacula										Adults				
Hemipteronotus splendens										Adults				
Hippocampus spp.						Adults, Early juveniles, Late juveniles						Adults, Early juveniles, Late juveniles		
Holacanthus ciliaris						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					
Holacanthus tricolor									Adults					
Holocentrus ascensionis									Adults					
Holocentrus rufus	Adults						Adults		Adults					
Honeycomb cowfish									Adults	Adults				
Lachnolaimus maximus	Adults, Early juveniles, Late juveniles					Adults, Spawning adults			Adults, Eggs, Spawning adults			Early juveniles, Late juveniles		
Lactophrys bicaudalis												Adults		
Lactophrys quadricornis												Adults		

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Lactophrys trigonus												Adults		
Lactophrys triqueter									Adults	Adults				
Lutjanus analis				Adults			Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Eggs, Larvae, Late juveniles, Postlarv., Spawning adults		Adults	Adults, Early juveniles, Late juveniles	Spawning adults	
Lutjanus apodus						Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles	Eggs, Larvae	Adults, Early juveniles, Late juveniles, Spawning adults			Adults, Early juveniles, Late juveniles		
Lutjanus buccanella	Early juveniles					Adults, Early juveniles, Late juveniles, Spawning adults		Eggs	Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles				

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Lutjanus griseus							Adults, Early juveniles, Late juveniles	Eggs, Larvae	Adults, Early juveniles, Eggs, Larvae, Late juveniles, Spawning adults			Adults, Early juveniles, Late juveniles, Postlarv.	Spawning adults	
Lutjanus jocu						Adults, Late juveniles	Adults, Early juveniles, Late juveniles	Eggs, Larvae	Adults, Late juveniles, Spawning adults			Adults, Early juveniles, Late juveniles		
Lutjanus mahogoni	Adults, Early juveniles, Late juveniles			Early juveniles		Adults, Early juveniles, Late juveniles	Late juveniles	Eggs, Larvae	Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles	Adults	Adults, Early juveniles, Late juveniles		
Lutjanus synagris	Adults, Early juveniles, Late juveniles					Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles	Eggs	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Spawning adults	Adults, Early juveniles, Late juveniles, Postlarv.	Adults	Adults, Early juveniles, Late juveniles

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
<i>Lutjanus vivanus</i>						Adults				Adults	Adults			Adults
<i>Malacanthus plumieri</i>										Adults				
<i>Melichthys niger</i>									Adults, Late juveniles	Adults				
<i>Microspathodon chrysurus</i>							Adults		Adults, Early juveniles, Late juveniles, Postlarv.					
<i>Mulloidichthys martinicus</i>							Adults		Adults	Adults				
<i>Mycteroperca tigris</i>						Adults			Adults, Spawning adults					
<i>Mycteroperca venenosa</i>						Adults, Late juveniles, Spawning adults			Adults, Late juveniles			Early juveniles, Late juveniles		
<i>Myrichthys oculatus</i>									Adults		Adults	Adults		Adults
<i>Myripristis jacobus</i>									Adults					
<i>Ocyurus chrysurus</i>	Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles				Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles	Eggs	Adults, Early juveniles, Late juveniles, Postlarv.	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.	Adults	Early juveniles

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Ogcocephalus spp.						Adults			Adults			Adults		
Ophioblennius atlanticus									Adults, Late juveniles					
Opistognathus aurifrons										Adults				
Opistognathus whitehursti										Adults				
Paranthias furcifer									Adults, Spawning adults					
Pomacanthus arcuatus							Adults		Adults, Late juveniles	Adults, Late juveniles		Adults		
Pomacanthus paru									Adults, Late juveniles					
Pomacentrus fuscus									Adults, Spawning adults					
Pomacentrus leucostictus							Adults		Adults, Early juveniles, Late juveniles, Postlarv., Spawning adults					

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Pomacentrus partitus	Adults						Adults		Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles				
Pomacentrus planifrons									Adults, Early juveniles, Late juveniles, Spawning adults					
Priacanthus arenatus						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					
Priacanthus cruentatus									Adults					
Pristipomoides macrophtalmus						Adults		Eggs, Larvae		Adults	Adults, Spawning adults			
Pseudupeneus maculatus									Adults	Adults		Adults		
Rhomboplites aurubens	Adults, Early juveniles, Late juveniles					Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Rypticus saponaceus						Adults, Early juveniles, Late juveniles	Late juveniles		Adults, Early juveniles, Late juveniles			Late juveniles		
Scarus coelestinus									Adults					
Scarus coeruleus						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles		
Scarus croicensis	Adults						Adults		Adults	Adults		Adults		
Scarus guacamaia							Adults		Adults					
Scarus taeniopterus									Adults					
Scarus vetula									Adults					
Scorpaenidae nei						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
<i>Seriola dumerili</i>					Early juveniles, Late juveniles			Adults, Eggs, Larvae, Postlarv., Spawning adults	Adults					
<i>Seriola rivoliana</i>					Early juveniles, Late juveniles			Adults, Eggs, Spawning adults						
<i>Serranus annularis</i>						Adults			Adults					
<i>Serranus baldwini</i>	Early juveniles									Adults				
<i>Serranus tabacarius</i>	Early juveniles								Adults	Adults				
<i>Serranus tigrinus</i>	Early juveniles					Adults			Adults					
<i>Serranus tortugarum</i>										Adults				
<i>Sparisoma aurofrenatum</i>									Adults					
<i>Sparisoma chrysotermum</i>	Adults						Adults		Adults			Adults		
<i>Sparisoma rubripinne</i>									Adults					
<i>Sparisoma viride</i>	Adults						Adults		Adults					

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Syngnathus spp.												Adults, Early juveniles, Late juveniles		
Synodus intermedius										Adults				
Thalassoma bifasciatum	Adults						Adults		Adults, Early juveniles, Late juveniles, Postlarv., Spawning adults	Adults, Early juveniles, Late juveniles, Postlarv.				
Xanthichthys ringens									Adults					

Marine: Spiny Lobster FMP

SPECIES_SCI	Benthic algae	Hard bottoms	Mangrove	Pelagic	Reef	Seagrasses
Panulirus argus	Early juveniles, Postlarvae	Adults, Early juveniles	Late juveniles	Larvae	Adults, Early juveniles, Eggs, Late juveniles, Spawning adults	Adults, Late juveniles, Postlarvae
Panulirus guttatus				Larvae	Adults, Early juveniles, Eggs, Late juveniles, Postlarvae, Spawning adults	
Panulirus laevicauda					Adults	

Marine: Queen Conch FMP

SPECIES_SCI	Benthic algae	Hard bottoms	Pelagic	Reef	Rubble	Sand/Shell bottoms	Seagrasses
Astrea tuber				Adults, Early juveniles, Late juveniles			
Cassis flammea							Adults
Cassis madagascarensis							Adults, Early juveniles, Late juveniles
Cassis tuberosa		Adults					Adults, Early juveniles, Late juveniles
Charonia variegata		Adults				Adults	
Cittarium pica		Adults, Early juveniles, Late juveniles					
Fasciolaria tulipa		Adults		Adults			Adults
Strombus costatus	Adults, Early juveniles, Late juveniles	Adults					Adults, Early juveniles, Late juveniles
Strombus gallus	Adults						Adults

Table 2.8. Habitat use by species/life stages of Caribbean FMP species (Marine continued)

SPECIES_SCI	Benthic algae	Hard bottoms	Pelagic	Reef	Rubble	Sand/Shell bottoms	Seagrasses
Strombus gigas	Adults	Adults	Larvae	Adults	Adults	Adults, Early juveniles, Eggs, Late juveniles, Spawning adults	Adults, Late juveniles, Spawning adults
Strombus pugilis	Adults, Early juveniles, Late juveniles	Adults					Adults, Early juveniles, Late juveniles
Strombus raninus							Adults
Vasum muricatum	Adults						Adults

Table 2.9. Allowable fishing gears in the Caribbean Council Fishery Management Plans.

Caribbean Fishery Management Council	
Fishery	Allowable Gear Types
Caribbean Spiny Lobster FMP:	
A. Trap/pot fishery	A. Trap/pot
B. Dip net fishery	B. Dip net
C. Entangling net fishery	C. Gillnet, trammel net
D. Recreational fishery	D. Dip net, trap, pot, gillnet, trammel net
Caribbean Shallow Water Reef Fish FMP:	
A. Longline/hook and line fishery	A. Longline, hook and line.
B. Trap/pot fishery	B. Trap, pot.
C. Entangling net fishery	C. Gillnet, trammel net
D. Recreational fishery	D. Dip net, handline, rod and reel, slurp gun, spear
Coral and Reef Resources FMP:	
A. Commercial fishery	A. Dip net, slurp gun.
B. Recreational fishery	B. Dip net, slurp gun
Queen Conch FMP:	
A. Commercial fishery	A. Hand harvest only
B. Recreational fishery	B. Hand harvest only

Table 2.10. CFMC History of Fisheries Habitat Conservation

NAME OF AREA	Jurisdiction	Area (n/m ²)	Closed since	Species	Season
Hind Bank St. Thomas	Federal	16 16	1990 1999	Red Hind All Species	Dec-Feb Year-round
Tourmaline Puerto Rico	Federal/State	15 9	1993 1996	Red Hind All Species	Dec-Feb Dec-Feb
Lang Bank St. Croix	Federal	~3	1993	Red Hind All Species	Dec-Feb
Mutton Area St. Croix	Federal/State	~2	1993	Mutton Snapper	Mar-Jun
Bajo de Cico Puerto Rico	Federal/State	9	1996	Red Hind All Species	Dec-Feb
Abrir La Sierra Puerto Rico	Federal/State	9	1996	Red Hind All Species	Dec-Feb

Table 2.11. Total catch by gear from Puerto Rico (data from Matos-Caraballo 2001)

	Year					
	1998	1999	2000	Average	Rank	Rate
Vertical Gear	942	950	969	954	1	High = 3
Trap/Pots	766	724	659	716	2	High = 3
Gill Nets	650	630	564	615	3	High = 3
Hand Harvest	438	379	475	431	4	Moderate = 2
Spear	190	174	215	193	5	Moderate = 2
Longline	55	66	67	63	6	Moderate = 2
Slurp Gun*	<5	<5	<5	<5	7	Low = 1
Dip Nets*	<5	<5	<5	<5	8	Low = 1

*The total harvest of ornamentals averages less than 30,000 individual/year 1998-2000.

Table 2.12. Possible actions to minimize fishing impacts on EFH from gears used in fisheries managed by a Caribbean FMP.

Longline	hook & line (bandit rig or rod & reel)	trap/pot	gill & trammel net	Spear	dip net	hand harvest
No restrictions	No restrictions	No restrictions	No restrictions	no restrictions	No restrictions	No restrictions
Limit gear to 500 feet on coral or hard/live bottom habitat	Require use of circle hooks	Restrict traps and pots to a single gear per buoy	Prohibit mechanical net haulers on coral habitat	Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent
Limit gear length to 500'	Require use of buoys on anchor lines so retrieval is straight up	Require buoys on all traps/pots	Reduce fishing effort by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent
Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent	transport all traps from the fishing ground to land-based storage at the completion of each fishing trip	Establish time or area closure that restricts fishing activity by x, y, or z percent	Prohibit use of Scuba while spearfishing	Prohibit on coral or hard/live bottom habitat	Prohibit on coral or hard/live bottom habitat
Establish time or area closure that restricts fishing activity by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent	Reduce fishing effort by x, y, or z percent	Prohibit the gear on coral habitat	Prohibit on coral or hard/live bottom habitat		
Prohibit on coral or hard/live bottom habitat	Prohibit anchoring on coral or hard/live bottom habitat while fishing with vertical gear	Establish time or area closure that restricts fishing activity by x, y, or z percent	Prohibit in the Caribbean EEZ			

Longline	hook & line (bandit rig or rod & reel)	trap/pot	gill & trammel net	Spear	dip net	hand harvest
Prohibit in the Caribbean EEZ	Prohibit on coral or hard/live bottom	Prohibit on coral or hard/live bottom or SAV habitat within a 500 ft buffer				
	Prohibit in the Caribbean EEZ	Prohibit on coral or hard/live bottom or SAV habitat				
		Prohibit in the Caribbean EEZ				

Table 2.13 Comparison of US Caribbean EFH Alternatives

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Physical	Puerto Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Ocean water characteristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality
	Estuarine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Marine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats
	Environmental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fishery resources under FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species
	Fishery resources not under Caribbean Council FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Marine Mammals and protected species	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species
	Fisheries	There are no direct impacts, but some indirect impacts because under this Alternative no EFH would be described and identified, so while the Council could still consider adverse fishing impacts, it could not use EFH information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the EFH described and identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be essentially the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information on this EFH could be used as a justification to make recommendations to the USVI to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fishing communities	There are no direct impacts, but some indirect impacts as no EFH is described and identified, and therefore cannot be used to justify actions taken to minimize adverse fishing impacts, there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be the same as at present, so the information on current EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the USVI to minimize fishing impacts, possibly resulting in less controversy

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Admin-istrative	Federal	There are direct impacts because under this Alternative no EFH would be described and identified, so EFH would not be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative, the EFH described and identified would not change, and EFH would remain part of the consultation process. In order to implement this Alternative, no FMP Amendment would be required	There are direct impacts because under this Alternative the EFH described and identified would be about the same as at present, and EFH would remain a part of the consultation process. However, in order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative less EFH would be described and identified than at present, but that EFH would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required
	State	The states would not receive recommendations from the Council based on EFH considerations under this amendment	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Physical	Puerto Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Ocean water characteristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Estuarine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats
	Marine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Environmental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest
Human Environment	Fishery resources under FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fishery resources not under Caribbean Council FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species
	Marine Mammals and protected species	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fisheries	There are no direct impacts, but some indirect impacts because under this Alternative no EFH would be described and identified, so while the Council could still consider adverse fishing impacts, it could not use EFH information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the EFH described and identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be essentially the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information on this EFH could be used as a justification to make recommendations to the USVI to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ
	Fishing communities	There are no direct impacts, but some indirect impacts as no EFH is described and identified, and therefore cannot be used to justify actions taken to minimize adverse fishing impacts, there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be the same as at present, so the information on current EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the USVI to minimize fishing impacts, possibly resulting in less controversy

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
	Federal	There are direct impacts because under this Alternative no EFH would be described and identified, so EFH would not be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative, the EFH described and identified would not change, and EFH would remain part of the consultation process. In order to implement this Alternative, no FMP Amendment would be required	There are direct impacts because under this Alternative the EFH described and identified would be about the same as at present, and EFH would remain a part of the consultation process. However, in order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative less EFH would be described and identified than at present, but that EFH would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required
Admin-istrative	State	The states would not receive recommendations from the Council based on EFH considerations under this amendment	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Physical	Puerto Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
Biological	Ocean water characteristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Biological	Estuarine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats
	Marine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats
	Environmental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fishery resources under FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species
	Fishery resources not under Caribbean Council FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species
	Marine Mammals and protected species	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Human Environment	Fish-eries	There are no direct impacts, but some indirect impacts because under this Alternative no EFH would be described and identified, so while the Council could still consider adverse fishing impacts, it could not use EFH information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the EFH described and identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be essentially the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information on this EFH could be used as a justification to make recommendations to the USVI to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ
	Fishing comm-unities	There are no direct impacts, but some indirect impacts as no EFH is described and identified, and therefore cannot be used to justify actions taken to minimize adverse fishing impacts, there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be the same as at present, so the information on current EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the USVI to minimize fishing impacts, possibly resulting in less controversy

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
Admin-istrative	Federal	There are direct impacts because under this Alternative no EFH would be described and identified, so EFH would not be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative, the EFH described and identified would not change, and EFH would remain part of the consultation process. In order to implement this Alternative, no FMP Amendment would be required	There are direct impacts because under this Alternative the EFH described and identified would be about the same as at present, and EFH would remain a part of the consultation process. However, in order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative less EFH would be described and identified than at present, but that EFH would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required
	State	The states would not receive recommendations from the Council based on EFH considerations under this amendment	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations

Table 2.13d. Comparison of Coral FMP EFH Alternatives

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the coral FMP	Alternative 2. (Status Quo) EFH for the coral fishery consists of areas where various life stages of coral commonly occur	Alternative 6. (Preferred Alternative). EFH for the coral fishery in the US Caribbean consists of all waters and coral and hard bottom substrates from mean low water to the outer boundary of the EEZ
Physical	Puerto Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present
	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present
Biological	Ocean water characteristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present
	Estuarine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would change very little

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the coral FMP	Alternative 2. (Status Quo) EFH for the coral fishery consists of areas where various life stages of coral commonly occur	Alternative 6. (Preferred Alternative). EFH for the coral fishery in the US Caribbean consists of all waters and coral and hard bottom substrates from mean low water to the outer boundary of the EEZ
Biological	Marine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would change very little
	Environmental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would change very little
Human Environment	Fishery resources under FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the coral FMP	Alternative 2. (Status Quo) EFH for the coral fishery consists of areas where various life stages of coral commonly occur	Alternative 6. (Preferred Alternative). EFH for the coral fishery in the US Caribbean consists of all waters and coral and hard bottom substrates from mean low water to the outer boundary of the EEZ
Human Environment	Fishery resources not under Caribbean Council FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change
	Marine Mammals and protected species	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change
	Fisheries	There are no direct impacts, but some indirect impacts because under this Alternative no EFH would be described and identified, so while the Council could still consider adverse fishing impacts, it could not use EFH information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the EFH described and identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be essentially the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the coral FMP	Alternative 2. (Status Quo) EFH for the coral fishery consists of areas where various life stages of coral commonly occur	Alternative 6. (Preferred Alternative). EFH for the coral fishery in the US Caribbean consists of all waters and coral and hard bottom substrates from mean low water to the outer boundary of the EEZ
Human Environment	Fishing communities	There are no direct impacts, but some indirect impacts as no EFH is described and identified, and therefore cannot be used to justify actions taken to minimize adverse fishing impacts, there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be the same as at present, so the information on current EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities
Administrative	Federal	There are direct impacts because under this Alternative no EFH would be described and identified, so EFH would not be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative, the EFH described and identified would not change, and EFH would remain part of the consultation process. In order to implement this Alternative, no FMP Amendment would be required	There are direct impacts because under this Alternative the EFH described and identified would be about the same as at present, and EFH would remain a part of the consultation process. However, in order to implement this Alternative, an FMP Amendment would be required
	State	The states would not receive recommendations from the Council based on EFH considerations under this amendment	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on EFH considerations under this amendment. The states might or might not act on such recommendations

Table 2.14 Comparison of US Caribbean HAPC Alternatives

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Physical	Puerto Rico	No direct impacts, but some indirect impacts because HAPCs previously identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
	USVI	No direct impacts, but some indirect impacts because HAPCs previously identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Physical	Ocean water characteristics	No direct impacts, but some indirect impacts because HAPCs previously identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality
Biological	Estuarine	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Biological	Marine	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats
	Environmental sites of special interest	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Human Environment	Fishery resources under FMPs	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species
	Fishery resources not under Caribbean Council FMPs	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by non-FMP species

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Human Environment	Marine Mammals and protected species	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts and no change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species would not change	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by marine mammals and protected species

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Human Environment	Fish-eries	There are no direct impacts, but some indirect impacts because under this Alternative no HAPCs would be identified, so while the Council could still consider adverse fishing impacts, it could not use HAPC information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the HAPCs identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding these HAPCs as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the Reef Fish FMP HAPCs identified would be less than at present. Some HAPCs would occur in state waters, so the information on these Reef Fish FMP HAPCs could only be used as a justification to make recommendations to the states to minimize fishing impacts. Other HAPCs occur in the EEZ and information on these could be used to justify actions taken by the Council in the EEZ	There are no direct impacts, but some indirect impacts because under this Alternative the Reef Fish FMP HAPCs identified would be less than at present and would all occur in state waters, so the information on these Reef Fish FMP HAPCs could be used as a justification to make recommendations to the states to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ	There are no direct impacts, but some indirect impacts because under this Alternative the Coral FMP HAPCs identified would be less than at present and would all occur in state waters, so the information on these Coral FMP HAPCs could be used as a justification to make recommendations to the states to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Human Environment	Fishing communities	There are no direct impacts, but some indirect impacts as no HAPCs would be identified, and therefore could not be used to justify actions taken to minimize adverse fishing impacts, so there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the HAPCs identified would be the same as at present, so the information on current HAPCs could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the Reef Fish FMP HAPCs identified would be less than at present, with some occurring in state waters and others in the EEZ. Information on HAPCs in state waters could only be used to make recommendations to the states to minimize fishing impacts, possibly resulting in less controversy. Controversy may be intermediate	There are no direct impacts, but some indirect impacts because under this Alternative the Reef Fish FMP HAPCs identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the states to minimize fishing impacts, possibly resulting in less controversy	There are no direct impacts, but some indirect impacts because under this Alternative the Coral FMP HAPCs identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the states to minimize fishing impacts, possibly resulting in less controversy
Administrative	Federal	There are direct impacts because under this Alternative no HAPCs would be identified, so HAPCs would not be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative, the HAPCs identified would not change, and HAPCs would remain part of the consultation process. In order to implement this Alternative, no FMP Amendment would be required	There are direct impacts because under this Alternative less Reef Fish FMP HAPCs would be identified than at present, but those HAPCs would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative less Reef Fish FMP HAPCs would be identified than at present, but those HAPCs would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required	There are direct impacts because under this Alternative less Coral FMP HAPCs would be identified than at present, but those HAPCs would be part of the consultation process. In order to implement this Alternative, an FMP Amendment would be required

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	Alternative 4 Designate HAPCs in the Reef Fish FMP based on the occurrence of spawning locations.	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Administrative	State	The states would not receive recommendations from the Council based on HAPC considerations under this amendment	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Physical	Puerto Rico	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state
	USVI	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state
	Ocean water characteristics	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state
Biological Environment	Estuarine	No direct or indirect impacts because no estuaries occur in the EEZ	No direct or indirect impacts because no estuaries occur in the EEZ	No direct or indirect impacts because no estuaries occur in the EEZ	No direct or indirect impacts because no estuaries occur in the EEZ	No direct or indirect impacts because no estuaries occur in the EEZ	No direct or indirect impacts because no estuaries occur in the EEZ

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Biological	Marine	No change in direct or indirect impacts from those presently occurring. No additional protection for EEZ habitats	Alternative 2 would result in 1) less grappling to recover unbuoyed traps, resulting in less damage to EEZ habitats, especially coral and hard bottom; 2) less tendency for anchor to drag when retrieved, resulting in a decrease in damage to EEZ habitats, especially corals.	In addition to the consequences of Alternative 2, Alternative 2.5 would: 3) reduce damage (e.g. crushing) on inferred EEZ spawning habitats from pots/traps, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternative 2 and 2.5, Alternative 3 would: 3) diminish damage to EEZ habitats, especially corals, from the shearing action of trotlines and grappling to recover trotline traps, but would also prevent fishers from using trotlines in habitats where they have no adverse effects; 4), 5), & 6) reduce damage (e.g. snagging, shearing, crushing) on inferred EEZ spawning habitats from fishing gears with adverse impacts, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternatives 2, 2.5 and 3, Alternative 4 would: 2), 3), 4), 5), & 6) eliminate damage (e.g. snagging, shearing, crushing, grappling) to known EEZ coral habitat, but would likely shift fishing effort to non-prohibition areas	Alternative 5 would result in 1), 2), 3), 4), & 5) the elimination of damage to all EEZ habitats from gears with adverse impacts, but may shift former EEZ fishing effort to state waters and increase habitat damage there

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Biological	Environmental sites of special interest	No change in direct or indirect impacts from those presently occurring. No additional protection for environmental sites of special interest in the EEZ	Alternative 2 would result in 1) less grappling to recover unbuoyed traps, resulting in less damage to environmental sites of special interest in the EEZ, especially coral and hard bottom; 2) less tendency for anchor to drag when retrieved, resulting in a decrease in damage to environmental sites of special interest in the EEZ, especially coral habitat.	In addition to the consequences of Alternative 2, Alternative 2.5 would: 3) reduce damage (e.g. crushing) on environmental sites of special interest which are inferred EEZ spawning habitats from pots/traps, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternative 2 and 2.5, Alternative 3 would: 3) diminish damage to environmental sites of special interest in the EEZ, especially corals, from the shearing action of trotlines and grappling to recover trotline traps, but would also prevent fishers from using trotlines in habitats where they have no adverse effects; 4), 5), & 6) reduce damage (e.g. snagging, shearing, crushing) on environmental sites of special interest which are inferred EEZ spawning habitats from fishing gears with adverse impacts, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternatives 2, 2.5 and 3, Alternative 4 would: 2), 3), 4), 5), & 6) eliminate damage (e.g. snagging, shearing, crushing, grappling) to environmental sites of special interest which are known EEZ coral habitat, but would likely shift fishing effort to non-prohibition areas	Alternative 5 would result in 1), 2), 3), 4), & 5) the elimination of damage to all environmental sites of special interest in the EEZ from gears with adverse impacts, but may shift former EEZ fishing effort to state waters and increase habitat damage there

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Biological Environment	Fishery resources under FMPs	No change in direct or indirect impacts from those presently occurring. No additional protection for EEZ habitats used by FMP species	Alternative 2 would result in 1) less grappling to recover unbuoyed traps, resulting in less damage to EEZ habitats used by FMP species, especially coral and hard bottom; 2) less tendency for anchor to drag when retrieved, resulting in a decrease in damage to EEZ habitats used by FMP species, especially corals.	In addition to the consequences of Alternative 2, Alternative 2.5 would: reduce damage (e.g. crushing) on inferred EEZ spawning habitats, used by reef fish from pots/traps, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternative 2 and 2.5, Alternative 3 would: 3) diminish damage to EEZ habitats used by FMP species, especially corals, from the shearing action of trotlines and grappling to recover trotline traps, but would also prevent fishers from using trotlines in habitats where they have no adverse effects; 4), 5), & 6) reduce damage (e.g. snagging, shearing, crushing) on inferred EEZ spawning habitats, used by reef fish, from fishing gears with adverse impacts, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternatives 2, 2.5 and 3, Alternative 4 would: 2), 3), 4), 5), & 6) eliminate damage (e.g. snagging, shearing, crushing, grappling) to known EEZ coral habitat used by FMP species. Overall catch of FMP species would likely decrease, but fishing effort might shift to non-prohibition areas to make up for lost catch	Alternative 5 would result in 1), 2), 3), 4), & 5) the elimination of damage to all EEZ habitats used by FMP species, from gears with adverse impacts, but may shift former EEZ fishing effort to state waters and increase habitat damage there. Reef fish and lobster catch in the EEZ would be essentially eliminated. May allow some recovery by protected and overfished species

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Biological	Fishery resources not under Caribbean Council FMPs	No change in direct or indirect impacts from those presently occurring. No additional protection for EEZ habitats used by non-FMP species	Alternative 2 would result in 1) less grappling to recover unbuoyed traps, resulting in less damage to EEZ habitats used by non-FMP species, especially coral and hard bottom; 2) less tendency for anchor to drag when retrieved, resulting in a decrease in damage to EEZ habitats used by non-FMP species, especially corals.	In addition to the consequences of Alternative 2, Alternative 2.5 would: 3) reduce damage (e.g. crushing) on inferred EEZ spawning habitats, used by non-FMP reef fish from pots/traps, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternative 2 and 2.5, Alternative 3 would: 3) diminish damage to EEZ habitats used by non-FMP species, especially corals, from the shearing action of trotlines and grappling to recover trotline traps, but would also prevent fishers from using trotlines in habitats where they have no adverse effects; 4), 5), & 6) reduce damage (e.g. snagging, shearing, crushing) on inferred EEZ spawning habitats, used by non-FMP reef fish, from fishing gears with adverse impacts, but will likely shift fishing effort to other non-closure sites.	In addition to the consequences of Alternatives 2, 2.5 and 3, Alternative 4 would: 2), 3), 4), 5), & 6) eliminate damage (e.g. snagging, shearing, crushing, grappling) to known EEZ coral habitat used by non-FMP species. Overall catch of non-FMP species might decrease, but fishing effort might shift to non-prohibition areas to make up for lost catch	Alternative 5 would result in 1), 2), 3), 4), & 5) the elimination of damage to all EEZ habitats used by non-FMP species, from gears with adverse impacts, but may shift former EEZ fishing effort to state waters and increase habitat damage there. Non-FMP reef fish catch in the EEZ would be essentially eliminated

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Biological Environment	Marine Mammals and protected species	No change in direct or indirect impacts from those presently occurring. No additional protection for EEZ habitats used by marine mammals and protected species	Buoys on pots/traps and trip line anchor retrieval are not expected to change impacts on marine mammals or protected species.	Buoys on pots/traps and trip line anchor retrieval are not expected to change impacts on marine mammals or protected species.	Although no US Caribbean fishing gears are listed in Category I or II for marine mammals, marine mammals and sea turtles may interact with gill/trammel nets and are being reconsidered for Category II designation. This Alternative might reduce interactions with gill/trammel nets in the EEZ	Although no US Caribbean fishing gears are listed in Category I or II for marine mammals, marine mammals and sea turtles may interact with gill/trammel nets and are being reconsidered for Category II designation. This Alternative might reduce interactions with gill/trammel nets in the EEZ	Although no US Caribbean fishing gears are listed in Category I or II for marine mammals, marine mammals and sea turtles may interact with gill/trammel nets and are being reconsidered for Category II designation. This Alternative would eliminate interactions with gill/trammel nets in the EEZ

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Human Environment	Fisheries	No change in direct or indirect impacts from those presently occurring.	No reduction in harvest would be expected, unless increased costs cause some EEZ fishers to leave the fishery. Cost to fishers of \$10-50 per trap for buoys and \$50 per boat for trip line anchor retrieval	Same consequences as Alternative 2 plus a likely reduction in total harvest due to pot/trap prohibitions on inferred spawning areas in the EEZ. Might cause fishers to increase effort outside of closed areas to make up for lost catch. Catch rates outside of spawning areas are likely to be relatively low, resulting in more time and money spent to obtain the same catch. May cause some pot/trap fishers to leave fishery.	Same consequences as Alternative 2 and 2.5 plus a further likely reduction in total harvest due to gear prohibitions on inferred spawning areas in the EEZ. Might cause fishers to increase effort outside of closed areas to make up for lost catch. Catch rates outside of spawning areas are likely to be relatively low, resulting in more time and money spent to obtain the same catch. May cause some fishers to leave fishery.	Same consequences as Alternative 3 plus an even greater reduction in total harvest due to gear prohibitions on all mapped coral habitat in the EEZ throughout the whole year. Might cause fishers to increase effort outside of closed areas to make up for lost catch. Catch rates outside of closed areas are likely to be lower, resulting in more time and money spent to obtain the same catch. May cause some fishers to leave fishery.	Alternative 5 would essentially eliminate reef fish and lobster catch in the EEZ, allowing only hand harvest. The elimination of fisheries in the EEZ will likely lead to increased fishing effort in state waters, with a more pronounced effect in the USVI where a greater proportion of the shelf occurs in the EEZ. Increased competition among fishers in a smaller area and heavier fishing pressure may lead to reduced catch rates in state waters.

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Human Environment	Fishing communities	No change in direct or indirect impacts from those presently occurring.	May cause controversy among EEZ fishers who presently use un-buoyed traps/pots and/or anchor in the EEZ	Controversy may occur because fishers see closed areas as too large and economic losses as too great	Controversy may occur because fishers see closed areas as too large and economic losses as too great	Controversy may occur because fishers see closed areas as too large and economic losses as too great	Controversy may occur because fishers see closed areas as too large and economic losses as too great. USVI fishers may also feel that they would be bearing a disproportionate burden
Administrative	Federal	No change in direct or indirect impacts from those presently occurring.	There would be administrative costs associated with amending the generic FMP or the individual fishery FMPs. Enforcement may be difficult due to limited resources for enforcement activities	There would be administrative costs associated with amending the generic FMP or the individual fishery FMPs. Enforcement may be difficult due to limited resources for enforcement activities and allowing some fishing gears while prohibiting others	There would be administrative costs associated with amending the generic FMP or the individual fishery FMPs. Enforcement may be difficult due to limited resources for enforcement activities and allowing some fishing gears while prohibiting others	There would be administrative costs associated with amending the generic FMP or the individual fishery FMPs. Enforcement may be difficult due to limited resources for enforcement activities and allowing some fishing gears while prohibiting others	There would be administrative costs associated with amending the generic FMP or the individual fishery FMPs. Enforcement may be simpler since almost all fishing would be prohibited in the EEZ

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

Affected Environment		Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	Alternative 4. Establish substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	Alternative 5. Establish total prohibitions on selected fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
Admin-istrative	State	No change in direct or indirect impacts from those presently occurring.	The states could receive recommendations from the Council based on gear impact considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on gear impact considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on gear impact considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on gear impact considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on gear impact considerations under this amendment. The states might or might not act on such recommendations

Table 2.16 Summary of cumulative effects of alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ

Affected Environment	Cumulative Effect	Alternatives to prevent, mitigate, or minimize adverse fishing impacts on EFH in the EEZ	Other actions that may address threats to EFH and fish productivity			
			Fishery management actions not directly addressing impacts on EFH		Non-fishing industries and development	
			Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions
Physical Environment	Changes to the physical structure of EFH	No effects	No effects	No effects	Some degraded water quality, dredging, and channelization	Adverse effects will continue into the future, but perhaps at a declining rate; non-fishing impacts main anthropogenic factor adversely affecting habitat
Biological Environment	Changes in the quality of EFH	Successively increasing restrictions of fishing impact alternatives adds increased improvements to EFH in EEZ. Preferred alternative is intermediate in effects. Alternative 5 eliminates damage from most gears. Comparable management in state waters needed for maximum benefits	Current gears with negligible, minor, or moderate habitat effects; adverse effects accumulating at a low rate.	Lower catch and likely lower effort should result in less effects to habitat, if restrictions occur in state and Federal waters	Current non-fishing effects continue to degrade habitat; increasing effect from development partially offset by EFH consultations	Adverse effects will continue into the future, but perhaps at a declining rate; non-fishing impacts main anthropogenic factor adversely affecting habitat

Table 2.16 Summary of cumulative effects of alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ

Affected Environment	Cumulative Effect	Alternatives to prevent, mitigate, or minimize adverse fishing impacts on EFH in the EEZ	Other actions that may address threats to EFH and fish productivity			
			Fishery management actions not directly addressing impacts on EFH		Non-fishing industries and development	
			Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions
	Population level effects on FMU species	Fishing impacts alternatives with successively increase in carrying capacity, but little increase in abundance, except Alternative 5 that closes the EEZ	Continue on-going trajectory of heavy fishing and lower than desirable abundance	Population recovery resulting from lower fishing mortality; fish occupy more habitat	Current non-fishing impacts continue to degrade fish productivity; increasing effect from development partially offset by EFH consultation	Adverse effects will continue into the future, but perhaps at a declining rate
	Ecosystem changes	Reductions in habitat damage could increase availability for ecological functions; fishing impacts alternatives with possible successively increasing coral biodiversity	Continue on-going trajectory of heavy fishing and lower than desirable abundance, resulting in adverse effects to coral ecosystem	Lower catch should result in lower effort, with possible reductions in habitat damage, which would increase availability for ecological functions	Current non-fishing impacts continue with costs to habitat, fish productivity, and ecological functions	Reduced loss of habitat or improvement in habitat would increase availability for ecological functions
	Effects on marine mammals, turtles, and birds	Improvements to EFH may benefit other species using the habitat. Fishing alternatives not expected to change interactions with gear	Some turtle-gill/trammel net interactions, possible marine mammal-gill/trammel net interactions	Lower effort may reduce interactions	Current non-fishing habitat degradation reduces habitat for marine mammals, turtles, and birds	Any habitat loss reduction or habitat improvement may benefit

Table 2.16 Summary of cumulative effects of alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ

Affected Environment	Cumulative Effect	Alternatives to prevent, mitigate, or minimize adverse fishing impacts on EFH in the EEZ	Other actions that may address threats to EFH and fish productivity			
			Fishery management actions not directly addressing impacts on EFH		Non-fishing industries and development	
			Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions
Administrative Environment	Effects on management and administration requirements	Change from status quo would require FMP amendments	Lower than desirable stock abundance under current FMPs	Revisions to FMPs (SFA Amendment) under progress to address management issues	Currently under requirements of various federal and state laws	Increased management requires more monitoring and enforcement
	Effects on enforcement requirements	Enforcement of regulations is feasible, but requires additional enforcement resources	Enforcement capabilities strained by current regulations	Increased enforcement from current level needed for compliance; restrictions could include quotas, gear restrictions, closed areas.	Enforcement by various Federal and state agencies	Increased level of monitoring and enforcement possibly needed if restrictions increase
Human Environment	Net economic change to fishers	Fishing provides small but important revenue (average several thousand dollars per year per fisher); little prospect for improvement	Continue on-going trajectory of heavy fishing and lower than desirable fish abundance and current income	Little or no economic improvement for fishers under open access – dissipation of benefits	Reduced stock abundance from continued habitat degradation would reduce net value of fisheries	Potential benefits to fishers if fish have more available habitat; no increased costs to fishers
	Effects on development	No change	No change	No change	No change	Consultations could lead to high effects: treatment of pollution, reduced development opportunities, restrictions on industrial plants

Table 2.17. Practicability summary for alternatives to address adverse fishing impacts

Practicability factors	Alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ					
	1	2	2.5	3	4	5
Net economic change to fishers	Fishing provides small revenue (only several thousand dollars per year); little prospect for improvement	Little or no economic improvement for fishers under open access; long-term dissipation of benefits; moderate additional short-term costs for anchor triplines and pot/trap buoys	Similar to Alt. 2; moderate additional cost to trap-pot fishers displaced from closed areas	Similar to Alt. 2.5; moderate additional cost to gill/trammel net and bottom longline fishers displaced from closed areas	Similar to Alt. 3; moderate additional cost to pot/trap, gill/trammel net, bottom longline, and SCUBA fishers displaced from coral areas; trapline prohibition decreases efficiency	Major additional costs to pot/trap, gill/trammel net, bottom longline, and spear fishers displaced from EEZ
Effect on enforcement, management, administration	Feasible enforcement requirements, but requires additional resources; no FMP amendments required	Increase enforcement from current level needed for compliance; FMP amendments required	Increase enforcement from Alt. 2 level needed for compliance; legal gears in areas closed to traps increase enforcement difficulty; FMP amendments required	Increase enforcement from Alt. 2.5 level needed for compliance, legal gears in areas closed to traps, gill nets, longlines increase enforcement difficulty	Increase enforcement from Alt. 3 level needed for compliance; legal gears in areas closed to traps, traplines, gill nets, longlines, SCUBA increase enforcement difficulty	Increase enforcement from status quo level needed for compliance, but likely less than gear and closed areas regs; few legal gears allowed in EEZ

Table 2.17. Practicability summary for alternatives to address adverse fishing impacts

Practicability factors	Alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ					
	1	2	2.5	3	4	5
Changes in EFH	On-going trajectory of changes – current gears with negligible, minor, or moderate impacts; adverse impacts accumulating at a low rate.	Anchor retrieval may benefit coral, hard bottom, if buoys used with traps less grappling benefits coral, hard bottom, but small amount of total EFH	Same as Alt. 2 plus no trap damage on coral in closed areas, but small amount of total EFH	Same as Alt. 2.5 plus reduced shearing, pot dragging if no traplines, and no gill/ trammel net and longline damage on coral in closed spawning areas, but small amount of total EFH	Same as Alt. 3 plus no trap, gill/ trammel net, bottom longline, or SCUBA damage on coral in mapped areas; no grappling damage in the EEZ	No damage from trap, gill/ trammel net, bottom longline, or spear
Population effects on FMU species from changes in EFH	Possible minor abundance declines from habitat damage, but minor compared to effects on population of high catch levels	Likely minor change in fish abundance – populations with lowered abundance don't use all available habitat; may improve carrying capacity for future growth in abundance, but without fish to occupy it	Same as Alt. 2, but progressively increased theoretical carrying capacity above Alt. 2	Same as Alt. 2, but progressively increased theoretical carrying capacity above Alt. 2.5	Same as Alt. 2, but progressively increased theoretical carrying capacity above Alt. 3	Large area closure likely to reduce harvest, increased theoretical carrying capacity above Alt. 4
Ecosystem changes from changes in EFH	Relatively small adverse impacts have affected mostly coral ecosystems	Any improvements in habitat increase availability for ecological functions	Same as Alt. 2 plus changes in pot/trap effort – possible decreased effort from area closure or possible effort increase in lower CPUE areas	Same as Alt. 2.5 plus effects of changes in effort from gill/ trammel nets and bottom longline	Same as Alt. 3 plus effects of changes in effort from pot/trap, gill/trammel net, bottom longline, and SCUBA fishers displaced from coral habitat and EEZ trapline prohibition	Decreased effort from area closure, possible increase diversity of coral, possible effort increase in lower CPUE areas

Table 3.1 (a) Areal extent (in hectares) of marine biotopes for coastal areas of Puerto Rico and the U.S. Virgin Islands

	<u>Vieques</u>	<u>Culebra</u>	<u>P.R.¹</u>	<u>St. Thomas</u>	<u>St. John</u>
Lagoons	1,295	68	2,069	---	---
Mangroves	395	345	3,580	---	---
Shallow sand	686	161	7,327	512	616
Deep sand	6,440	2,179	---	---	---
Shallow seagrasses	378	125	5,102	597	418
Shallow coral reefs	1,669	---	---	---	---
Deeper seagrasses and coral assemblages	21,838	----	---	---	669
Other coral reef areas	---	---	3,230	---	---
Reef-flat areas	---	377	---	---	---
Fringing reefs	---	---	409	---	---
Other reef areas	---	436	---	---	---
Inshore water	---	316	33,595	---	---
Turbid water	1,906	---	245	---	---
Shelf water	---	---	99,272	---	6,637
Cloud and cloud shadows	---	---	2,247	---	---

This table is a summary of information presented in "Thematic Mapping of the Coastal Marine Environments of Puerto Rico and the U.S. Virgin Islands" by Roy A. Armstrong.

¹ These numbers correspond only to the main island of Puerto Rico.

Table 3.1 (b) Areal extent (in hectares) of marine biotopes for coastal areas of Puerto Rico and the U.S. Virgin Islands

Habitat	Puerto Rico	US Virgin Islands
Unconsolidated Sediments	4,900	2,400
Submerged Aquatic Vegetation	72,100	161
Mangrove	7,300	200
Coral Reefs and Colonized Hard Bottom	75,000	30,000
Total Bottom	160,000	49,000

Source: NOS habitat maps: <http://biogeo.nos.noaa.gov/products/benthic/htm/overview.htm>

Table 3.2. Classification of habitat types used for the Caribbean fishery management plans.

Substratum Classification	Substratum
Estuarine	Seagrasses
	Mangroves
	Wetlands
	Benthic algae
	Drift algae
	Sand/ Shell bottoms
	Soft bottoms
	Pelagic
Marine	Seagrasses
	Mangroves
	Reefs
	Rubble
	Hardbottoms
	Benthic algae
	Drift algae
	Sand/ Shell bottoms
	Soft bottoms
	Shoals/ Banks
	Pelagic

Table 3.3. Known prey of various FMP species in the US Caribbean

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Serranidae	Epinephelus adscensionis	Rock hind	Adults	Marine crabs, fishes, shrimps, crustaceans, gastropods, and chitons
Reef Fish	Serranidae	Epinephelus cruentatus	Graysby	Adults	Fishes and crustaceans
Reef Fish	Serranidae	Epinephelus flavolimbatus	Yellowedge grouper	Adults	Squid
Reef Fish	Serranidae	Cephalopholis fulva	Coney	Adults	Fishes, shrimps, marine crabs, stomatopods, and crustaceans
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Larvae	Zooplankton feeders
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Late juveniles	Crabs, fishes, stomatopods, shrimps, crustaceans and echinoderms
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Adults	Crabs, fishes, stomatopods, shrimps, crustaceans and echinoderms
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Spawning adults	Yellowtail snapper, parrotfish, creole wrasse and creole fish
Reef Fish	Serranidae	Epinephelus itajara	Goliath grouper	Adults	Lobster (Panulirus argus) and Scyllardes aequitialis, fishes, crabs, and sea turtles
Reef Fish	Serranidae	Epinephelus mystacinus	Misty grouper	Adults	Fish, wenchman
Reef Fish	Serranidae	Epinephelus striatus	Nassau grouper	Early juveniles	Small grunts
Reef Fish	Serranidae	Epinephelus striatus	Nassau grouper	Adults	Fishes, crabs, stomatopods, cephalopods, shrimps, lobsters, gastropods, isopods, and bivalves
Reef Fish	Serranidae	Mycteroperca venenosa	Yellowfin grouper	Adults	Fishes
Reef Fish	Lutjanidae	Apsilus dentatus	Black snapper	Adults	Fishes, burrowing animals, detritus and pelagic tunicates
Reef Fish	Lutjanidae	Etelis oculatus	Queen snapper	Adults	Fishes, squids, and crustaceans (shrimps and crabs)
Reef Fish	Lutjanidae	Lutjanus analis	Mutton snapper	Late juveniles	Gammarids, fish parts, and Natantia shrimp
Reef Fish	Lutjanidae	Lutjanus analis	Mutton snapper	Adults	Crabs, fishes, gastropods, hermit crabs, lobsters, and stomatopods

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Early juveniles	Crustaceans (particularly amphipods), penaeid shrimps, crabs, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Late juveniles	Fishes, crabs, stomatopods, shrimps, gastropods, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Adults	Fishes, crabs, stomatopods, shrimps, and gastropods
Reef Fish	Lutjanidae	Lutjanus buccanella	Blackfin snapper	Early juveniles	Grunts
Reef Fish	Lutjanidae	Lutjanus buccanella	Blackfin snapper	Adults	Fishes, tunicates, and squid
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Early juveniles	Crustaceans (mainly amphipods and copepods)
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Late juveniles	Feed in Thalassia beds on amphipods, shrimps, crabs, copepods, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Adults	Feeds in Thalassia beds and sandy bottoms. Consume primarily fishes among Red Mangrove roots. Possible prey Jenkinsia Lamprotaenia
Reef Fish	Lutjanidae	Lutjanus jocu	Dog snapper	Late juveniles	Crustaceans
Reef Fish	Lutjanidae	Lutjanus jocu	Dog snapper	Adults	Fishes, crabs, lobsters, gastropods, squids, fish eggs, lobster eggs and crustaceans
Reef Fish	Lutjanidae	Lutjanus mahogoni	Mahogany snapper	Adults	Night-feeding fishes, shrimps, and crabs
Reef Fish	Lutjanidae	Lutjanus synagris	Lane snapper	Late juveniles	Gammarids, Natantia shrimps, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus synagris	Lane snapper	Adults	Crabs and stomatopods
Reef Fish	Lutjanidae	Lutjanus vivanus	Silk snapper	Adults	Feeds on invertebrates (crabs and shrimps) and fishes
Reef Fish	Lutjanidae	Ocyurus chrysurus	Yellowtail snapper	Late juveniles	Planktonic organisms; gammarids, fish parts, cumaceans, shrimps, Natantia shrimps, ostracods, brachyuran crabs, fish scales, copepods, prosobranchs, nematodes, isopods, Caprellid, Thorassica, and Errantia
Reef Fish	Lutjanidae	Ocyurus chrysurus	Yellowtail snapper	Adults	Feeds on crabs, shrimps, fishes and their larvae, and fish eggs

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Lutjanidae	<i>Pristipomoides macrophthalmus</i>	Wenchman	Adults	Deepwater shrimps and crabs
Reef Fish	Lutjanidae	<i>Rhomboplites aurubens</i>	Vermilion snapper	Adults	Planktonic organisms and crustaceans
Reef Fish	Haemulidae	<i>Haemulon aurolineatum</i>	Tomtate	Late juveniles	Gammarids, cumaceans, <i>Natantia</i> shrimp, copepods, and isopods
Reef Fish	Haemulidae	<i>Haemulon aurolineatum</i>	Tomtate	Adults	Shrimps, polychaetes, crustaceans, hermit crabs, larvae, gastropods, bivalves, crabs (including brachyurans)
Reef Fish	Haemulidae	<i>Haemulon flavolineatum</i>	French grunt	Late juveniles	Copepods, chitons, brachyuran crabs, ostracods, <i>Natantia</i> shrimps, cumacean shrimps, and gammarids
Reef Fish	Haemulidae	<i>Haemulon flavolineatum</i>	French grunt	Adults	Crabs, hermit crabs, shrimps; ontogenic preference in diet (50mm-79m: amphipods, 100mm-140mm: gastropods, 160mm-189mm: sipunculids and polychaetes)
Reef Fish	Haemulidae	<i>Haemulon plumieri</i>	White grunt	Postlarvae	Plankton
Reef Fish	Haemulidae	<i>Haemulon plumieri</i>	White grunt	Late juveniles	Amphipods, crabs, shrimps, crustaceans, gastropods, ophiurids, polychaetes, sipunculids, gammarids, cumaceans, ostracods, brachyuran crabs, copepods, prosobranchs, nematodes, and chitons
Reef Fish	Haemulidae	<i>Haemulon plumieri</i>	White grunt	Adults	Crabs (xanthid and majid), shrimps; ontogenic changes in diets (70mm-119mm: gastropods, 120-159mm: sipunculids, 160-249: amphipods and ophiuroids), crustaceans, and polychaetes
Reef Fish	Haemulidae	<i>Haemulon sciurus</i>	Bluestriped grunt	Late juveniles	Gammarids, ostracods, polychaete setae, fish scales, <i>Natantia</i> shrimps, cumaceans, and shrimps
Reef Fish	Haemulidae	<i>Haemulon sciurus</i>	Bluestriped grunt	Adults	Crabs, bivalves, amphipods, crustaceans, holothurians, ophiuroids, hermit crabs, and limpets
Reef Fish	Sparidae	<i>Archosargus rhomboidalis</i>	Sea bream	Spawning adults	Green algae, plant detritus, <i>Halophila</i> , red algae, and egg masses
Spiny Lobster	Palinuridae	<i>Panulirus argus</i>	Caribbean spiny lobster	Late juveniles	Mollusks, crustaceans, algae, echinoderms, coelenterates, annelids, and sponges

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Spiny Lobster	Palinuridae	Panulirus argus	Caribbean spiny lobster	Adults	Mollusks, crustaceans, algae, echinoderms, coelenterates, annelids, and sponges. Feeding takes place in seagrass beds
Queen Conch	Strombidae	Strombus gigas	Queen conch	Larvae	Small phytoplankton
Queen Conch	Strombidae	Strombus gigas	Queen conch	Early juveniles	Plankton
Queen Conch	Strombidae	Strombus gigas	Queen conch	Late juveniles	Feed most actively at night on filamentous and unicellular algae.
Queen Conch	Strombidae	Strombus gigas	Queen conch	Adults	Epiphytic algae on Thalssia testudinum, algae (Cladophora, Hypnea, Polysiphonia)

Table 3.4. Summary of distributional information for species other than queen conch (*Strombus gigas*) and *Astrea tuber* in the Queen Conch FMU (Academy of Natural Sciences of Philadelphia 2002)

Trochidae

Cittarium pica

Range: 26.5°N to 9.4°N; 88°W to 59.6°W

Depth: 0 to 2 m (live 0 to 0 m)

Maximum Reported Size: 136 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombidae

Strombus pugilis

Range: 26°N to 28.5°S; 83.08°W to 34.9°W

Depth: 0 to 55 m (live 1 to 55 m)

Maximum Reported Size: 110 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombus gallus

Range: 32.3°N to 21.62°S; 82°W to 28.9°W

Depth: 0.3 to 82 m (live 0.3 to 48 m)

Maximum Reported Size: 197 mm

Reported Distribution in US Caribbean: Virgin Islands: St. John

Strombus costatus

Range: 34.39°N to 21°S; 94°W to 29.3°W

Depth: 2 to 40 m (live 25 to 27 m)

Maximum Reported Size: 231 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombus raninus

Range: 34.33°N to 6°S; 93.8°W to 37°W

Depth: 0.3 to 55 m (live 0.3 to 6 m)

Maximum Reported Size: 121 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Cassidae

Cassis flammea

Range: 32.3°N to 9.4°N; 93.8°W to 59.6°W

Depth: 1 to 12 m (live 3 to 5 m)

Maximum Reported Size: 154 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Table 3.4. Summary of distributional information for species other than queen conch (*Strombus gigas*) and *Astrea tuber* in the Queen Conch FMU (continued)

Cassid madagascariensis

Range: 35°N to 10.5°N; 89.7°W to 64.8°W

Depth: 5 to 30 m (live 27 to 27 m)

Maximum Reported Size: 350 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Cassid tuberosa

Range: 35°N to 18°S; 92°W to 25°W

Depth: 0 to 27 m (live 0 to 9 m)

Maximum Reported Size: 301 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. John, St. Croix

Cymatiidae (Ranellidae)

Charonia variegata

Range: 34.39°N to 17°S; 97.28°W to 0°W

Depth: 0.3 to 110 m (live 0.3 to 45 m)

Maximum Reported Size: 374 mm

Reported Distribution in US Caribbean: Puerto Rico; Puerto Rico: Mona Island; Virgin Islands: St. Thomas, St. Croix

Fasciolaridae

Fasciolaria tulipa Range: 35°N to 4°N; 97.22°W to 51°W

Depth: 0 to 73 m (live 0.3 to 37 m)

Maximum Reported Size: 250 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Turbinellidae

Vasum muricatum

Range: 26.2°N to 9.4°N; 90.5°W to 64.6°W

Depth: 0 to 15 m (live 0.3 to 15 m)

Maximum Reported Size: 125 mm

Reported Distribution in US Caribbean: Puerto Rico; Virgin Islands: St. Thomas, St. John, St. Croix.

Table 3.5. Scores and ranks for each habitat function for each Caribbean FMP.

3.5a. Example of how scores were assigned

FMP	SubstratumType	Substratum Description	Feeding	Feeding Score
Queen Conch	Marine	Seagrasses	19	8
Queen Conch	Marine	Benthic algae	9	7
Queen Conch	Marine	Hard bottoms	9	7
Queen Conch	Marine	Sand/Shell bottoms	4	5
Queen Conch	Marine	Reef	2	4
Queen Conch	Marine	Pelagic	1	3
Queen Conch	Marine	Rubble	1	3
Queen Conch	Estuarine	Seagrasses	0	0

3.5b. Spawning rankings

Reef Fish FMP				Lobster FMP				Queen Conch FMP			
Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank
Marine	Reef	16	1	Marine	Reef	9	1	Estuarine	Seagrasses	8	1
Marine	Hard bottoms	15	2	Estuarine	Benthic algae	0	N/A	Marine	Sand/Shell	8	1
Marine	Sand/Shell	14	3	Estuarine	Mangrove	0	N/A	Marine	Seagrasses	8	1
Marine	Shoals/Banks	14	3	Estuarine	Seagrasses	0	N/A	Marine	Benthic algae	0	N/A
Marine	Pelagic	14	3	Marine	Benthic algae	0	N/A	Marine	Hard bottoms	0	N/A

Table 3.5. Scores and ranks for each habitat function for each Caribbean FMP (continued)

Reef Fish FMP				Lobster FMP				Queen Conch FMP			
Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank
Estuarine	Wetlands	0	N/A	Marine	Hard bottoms	0	N/A	Marine	Pelagic	0	N/A
Estuarine	Mangrove	0	N/A	Marine	Mangrove	0	N/A	Marine	Reef	0	N/A
Estuarine	Sand/Shell	0	N/A	Marine	Pelagic	0	N/A	Marine	Rubble	0	N/A
Estuarine	Seagrasses	0	N/A	Marine	Seagrasses	0	N/A				
Estuarine	Soft bottoms	0	N/A								
Marine	Benthic algae	0	N/A								
Marine	Drift Algae	0	N/A								
Marine	Mangrove	0	N/A								
Marine	Rubble	0	N/A								
Marine	Seagrasses	0	N/A								
Marine	Soft bottoms	0	N/A								

3.5.c Feeding Rankings

Reef Fish FMP				Lobster FMP				Queen Conch FMP			
Substratum Classification	Substratum	Feeding Score	Feeding Rank	Substratum Classification	Substratum	Feeding Score	Feeding Rank	Substratum Classification	Substratum	Feeding Score	Feeding Rank
Marine	Reef	16	1	Marine	Reef	9	1	Marine	Seagrasses	8	1
Marine	Seagrasses	15	2	Estuarine	Seagrasses	8	2	Marine	Benthic algae	7	2
Marine	Rubble	14	3	Marine	Hard bottoms	8	2	Marine	Hard bottoms	7	2
Estuarine	Seagrasses	13	4	Marine	Seagrasses	8	2	Marine	Sand/Shell	5	4
Marine	Hard bottoms	12	5	Estuarine	Benthic algae	5	5	Marine	Reef	4	5
Marine	Mangrove	11	6	Estuarine	Mangrove	5	5	Marine	Pelagic	3	6
Estuarine	Mangrove	10	7	Marine	Benthic algae	5	5	Marine	Rubble	3	6
Marine	Sand/Shell	9	8	Marine	Mangrove	5	5	Estuarine	Seagrasses	0	N/A
Marine	Soft bottoms	8	9	Marine	Pelagic	5	5				
Estuarine	Sand/Shell	7	10								
Estuarine	Soft bottoms	7	10								
Estuarine	Wetlands	5	12								
Marine	Shoals/Banks	5	12								
Marine	Benthic algae	5	12								
Marine	Pelagic	2	15								
Marine	Drift Algae	0	N/A								

3.5d. Growth rankings.

Reef Fish FMP				Lobster FMP				Queen Conch FMP			
Substratum Classification	Substratum	Growth Score	Growth Rank	Substratum Classification	Substratum	Growth Score	Growth Rank	Substratum Classification	Substratum	Growth Score	Growth Rank
Marine	Reef	16	1	Marine	Reef	9	1	Marine	Seagrasses	8	1
Marine	Seagrasses	15	2	Marine	Benthic algae	8	2	Marine	Reef	7	2
Estuarine	Seagrasses	14	3	Marine	Seagrasses	7	3	Marine	Benthic algae	6	3
Marine	Hard bottoms	13	4	Marine	Pelagic	7	3	Marine	Sand/Shell	5	4
Marine	Pelagic	12	5	Estuarine	Seagrasses	5	5	Marine	Hard bottoms	4	5
Marine	Mangrove	11	6	Marine	Hard bottoms	5	5	Marine	Pelagic	3	6
Estuarine	Mangrove	10	7	Estuarine	Benthic algae	5	5	Marine	Rubble	0	N/A
Marine	Rubble	9	8	Estuarine	Mangrove	5	5	Estuarine	Seagrasses	0	N/A
Marine	Sand/Shell	8	9	Marine	Mangrove	5	5				
Marine	Soft bottoms	7	10								
Marine	Benthic algae	7	10								
Estuarine	Wetlands	7	10								
Marine	Drift Algae	4	13								
Estuarine	Sand/Shell	3	14								
Estuarine	Soft bottoms	3	14								
Marine	Shoals/Banks	0	N/A								

Table 3.6. Scores for habitat use (for feeding, growth to maturity, and spawning) and ranks for ecological importance for each Caribbean FMP.

REEF FISH FMP

Aquatic sector	Habitat	Feeding Score	Growth Score	Spawning Score	Mean Score	Rank
Marine	Reef	16	16	16	16.0	1
Marine	Hard bottoms	12	13	15	13.3	2
Marine	Sand/Shell bottoms	9	8	14	10.3	3
Marine	Seagrasses	15	15	0	10.0	4
Marine	Pelagic	2	12	14	9.3	5
Estuarine	Seagrasses	13	14	0	9.0	6
Marine	Rubble	14	9	0	7.7	7
Marine	Mangrove	11	11	0	7.3	8
Estuarine	Mangrove	10	10	0	6.7	9
Marine	Shoals/Banks	5	0	14	6.3	10
Marine	Soft bottoms	8	7	0	5.0	11
Marine	Benthic algae	5	7	0	4.0	12
Estuarine	Wetlands	7	5	0	4.0	12
Estuarine	Sand/Shell bottoms	7	3	0	3.3	14
Estuarine	Soft bottoms	7	3	0	3.3	14
Marine	Drift Algae	0	4	0	1.3	16

LOBSTER FMP

Aquatic sector	Habitat	Feeding Score	Growth Score	Spawning Score	Mean Score	Rank
Marine	Reef	9	9	9	9.0	1
Marine	Seagrasses	8	7	0	5.0	2
Estuarine	Seagrasses	8	5	0	4.3	3
Marine	Hard bottoms	8	5	0	4.3	3
Marine	Benthic algae	5	8	0	4.3	3
Marine	Pelagic	5	7	0	4.0	6
Estuarine	Benthic algae	5	5	0	3.3	7
Estuarine	Mangrove	5	5	0	3.3	7
Marine	Mangrove	5	5	0	3.3	7

Table 3.6. Scores for habitat use (for feeding, growth to maturity, and spawning) and ranks for ecological importance for each Caribbean FMP. (continued)

QUEEN CONCH FMP

Aquatic sector	Habitat	Feeding Score	Growth Score	Spawning Score	Mean Score	Rank
Marine	Seagrasses	8	8	8	8.0	1
Marine	Sand/Shell bottoms	5	5	8	6.0	2
Marine	Benthic algae	7	6	0	4.3	3
Marine	Hard bottoms	7	4	0	3.7	4
Marine	Reef	4	7	0	3.7	4
Estuarine	Seagrasses	0	0	8	2.7	6
Marine	Pelagic	3	3	0	2.0	7
Marine	Rubble	3	0	0	1.0	8

Table 3.7. Distribution by coast and size of fishing vessels in Puerto Rico, 1975 (Suárez-Caabro 1979).

Number of fishing vessels by length (feet)						
COAST	<15	16-21	22-30	31-36	>36	TOTALS
North	14	100	7	1	1	123
East	27	80	27	4	0	138
South	90	163	7	2	4	266
West	92	219	22	2	3	338
TOTALS	223	562	63	8	8	865

Table 3.8. Number of certificates issued to boats in Puerto Rico (USCG).

FEET	NUMBER	COMMENTS
<16	22,725	Includes personal watercrafts
16<26	16,322	
26<40	4,001	
40<65	961	
>65	40	
TOTAL	44,049	
CATEGORIES		
Commercial Passenger	36	
Commercial Fishing	4,112	
Commercial Other	62	
Personal Watercrafts	9,156	

Table 3.9. Number of fishing vessels and motors reported in Puerto Rico's commercial fishery during 1995-96 (Matos-Caraballo 1997).

Number of fishing vessels by length (feet)							
COAST	<15	16-21	22-29	30-39	40-64	>65	TOTAL
North	91	232	41	3	0	0	367
East	95	197	68	10	2	0	372
South	108	280	28	2	2	0	420
West	75	206	51	5	5	0	342
TOTALS	369	915	188	20	9	0	1501

Table 3.10. U. S. Virgin islands fishing ports, licensed commercial and boat classes by island group, 1991-92. * = Fishing ports = Landing sites ** =Unknown (Annual Summary Report 1992-1993. U. S. Virgin Islands Division of Fish and Wildlife/National Marine Fisheries Service Cooperative Fishery Statistics Program #SF-42 (NA90AAHSF228).

Number of fishing vessels by length (feet)								
Island Group	*Fishing Ports	Commercial Fishers	<15	16-25	26-39	40-64	>65	U**
STT-STJ	10	230	36	113	30	3	0	48
STX	17	197	30	155	10	2	0	--

Table 3.11. Boat registration fees in the U.S. Virgin Islands

Boat Class	Pleasure	Commercial/Charter
Less than 16'	\$25	\$37.50
Class 1 - 16' but less than 26'	\$50	\$75
Class 2 - 26' but less than 40'	\$100	\$150
Class 3 - 40' but less than 65'	\$150	\$225
Class 4 - greater than 65'	\$200	\$300 max.

Table 3.12. Average fishery landings for 11 finfish groups, spiny lobster, and conch for the U.S. Caribbean (Puerto Rico and the U.S. Virgin Islands). (From CFMC Draft SFA Generic Amendment).

Average commercial fishery landings for 20 finfish groups, spiny lobster, and conch for the U.S. Caribbean (Puerto Rico and the U.S. Virgin Islands). Yearly commercial landings are shown for Puerto Rico from 1997 - 2001. Average total Virgin Island finfish landings (1,346,553 pounds; averaged over 5 years) are combined proportionately to Puerto Rico landings as a best estimate of total U.S. Caribbean landings (last column).

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
SNAPPER										
Unit 1										
SNAPPER, BLACK		207	672	403	20	1302	326			
SNAPPER, BLACKFIN	822	3689	4342	10652	9940	29445	5889			
SNAPPER, VERMILION	14022	16585	17240	22177	44891	114915	22983			
SNAPPER, SILK	285787	209384	224818	187639	282159	1189787	237957	12.08%	162,684	429,839
Unit 2										
SNAPPER, QUEEN	38778	46073	66695	82828	107671	342045	68409			
WENCHMAN	542	2303	3645	4953	7731	19174	3835	3.27%	53,450	125,694
Unit 3										
SNAPPER, GRAY		3	10	85	53	151	38			
SNAPPER, LANE	270275	221030	196988	204314	186580	1079187	215837			
SNAPPER, MUTTON	76602	77437	96377	84256	90583	425255	85051			
SNAPPERS, UNC	66957	55989	62110	48934	58468	292458	58492			
SNAPPER, DOG	10		78	75	1537	1700	425			
SNAPPER, SCHOOLM.	15	107	146	10	29	307	61			
SNAPPER, MAHOGAN	978	274	43	41	7	1343	269	16.29%	219,327	579,500
Unit 4										
SNAPPER, YELLOWT.	273088	252087	279467	360624	328961	1494227	298845	13.51%	181,982	480,827
GROUPE										
Unit 1										
GROUPE, NASSAU	15474	19107	14971	12947	18706	81205	16241	0.73%	9,890	26,131
Unit 2										
GOLIATH	85	142		27	50	304	76	0.0034%	46	122

Table 1. Continued.

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
Unit 3										
HIND, RED	60253	55012	65974	60901	69098	311238	62248			
CONEY	12103	13877	10262	11544	15929	63715	12743			
HIND, ROCK		113		113		226	113			
GRAYSBY			25			25	25			
CREOLE FISH				43		43	43	3.40%	45,776	120,947
Unit 4										
GROUPE, RED	18		7		28	53	18			
GROUPE, MISTY	4349	5562	6718	5246	6222	28097	5619			
GROUPE, BLACK						0	0			
GROUPE, TIGER						0	0			
GROUPE, YELLOWF.	2088	1793	3350	11208	3708	22147	4429			
GROUPE, YELLOWEDGE										
GROUPE, UNC	72655	43197	47891	40632	54005	258380	51676	2.79%	37,598	99,341
REEFFISHES										
GRUNTS										
GRUNT, WHITE	164401	112694	117124	114982	155878	665079	133016			
MARGATE	3612	2675	990	864	437	8578	536			
GRUNT, BLUESTRIFE	101	28	109	12	5	255	20			
GRUNT, FRENCH	7					7	7			
GRUNT, TOMTATE						0	0			
PORKFISH						0	0			
GRUNTS, UNC	190	234		57	88	569	142	6.05%	81,429	215,150
GOATFISH										
GOATFISH, SPOTTED	14106	11532	22340	16065	16149	80192	16038			
GOATFISH, YELLOW	4697	3478	3866	4266	6251	22558	4512			
GOATFISHES	6			103	75	184	61	0.93%	12,551	33,163

Table 3.12 Continued

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
PORGIES										
PORGIES,UNC	28431	26549	34586	28883	36374	154823	30965			
PORGY,JOLTHEAD					619	619				
PORGY,SHEEPSHEAD										
SEA BREAM		6				6	1			
PORGY,PLUMA				30	31	61	31	1.43%	19,252	50,867
SQUIRRELFISH										
SQUIRRELFISHES UN	21420	18773	14591	15689	18264	88737	17747			
SQUIRRELFISH	184	234	112	127	49	706	141			
SOLDIERFISH,BLACKBAR						0	0	0.81%	10,893	28,782
TILEFISH										
TILEFISHES	131			10		141	71			
TILEFISH,BLACKLIN	9	156	996	209	105	1475	295			
TILEFISH,SAND	463	464	12	18		957	239	0.027%	368	973
JACKS										
BLUE RUNNER	86	19	1			106	35			
HORSE-EYE JACK	1878	6126	5109	7568	6607	27288	5458			
BLACK JACK						0	0			
ALMACO JACK			17		851	868	434			
BAR JACK	24528	27180	40913	44680	50845	188146	37629			
GREATER AMBERJACK	802	270	151	7	8	1238	248			
JACK, YELLOW	426	3314	2021	2460	3934	12155	2431			
JACKS UNC	55394	35739	29999	29703	36415	187250	37450	3.78%	50,960	134,645

Table 1, Continued

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
PARROTFISHES										
PARROTFISH,MIDNIGHT										
PARROTFISH,STRIPED										
PARROTFISH,PRINCESS										
PARROTFISH,QUEEN										
PARROTFISH,REDBAND										
PARROTFISH,REDFIN										
PARROTFISH,BLUE	5	15	10		72	102	26			
PARROTFISH,RAINBOW			11			11	6			
PARROTFISH,REDTAIL			116			116	116			
PARROTFISH,STOPLI	44	61	30	12	9	156	31			
PARROTFISH UNC	110944	97503	80547	72865	99174	461033	92207	4.18%	56,258	148,642
SURGEONFISH										
DOCTORFISH										
SURGEON,OCEAN			9			9	9			
SURGEONFISHES UNC		4	4		20	28	9	0.0008%	11	29
TRIGGERFISH AND FILEFISH										
FILEFISH,SCRAWLED										
FILEFISH,WHITESPOTTED										
TRIGGERFISHES UNC	22	5	28	102	53	210	42			
TRIGGERFISH, OCEA	82		293	5		380	127			
DURGON,BLACK	24			731		755	378			
TRIGGERFISH,SARGA	6	15	92		18	131	33			
TRIGGERFISH,QUEEN	73200	64448	49591	40810	60858	288907	57781	2.64%	35,538	93,899
BOXFISH										
COWFISH,HONEYCOMB						0	0			
TRUNKFISH	898	224	175		505	1802	451			
BOXFISH	80995	90713	83758	83580	77309	416355	21913	1.01%	13,618	35,982
WRASSES										
HOGFISH,SPANISH	144	360	218	31	11	764	153			
PUDDINGWIFE					104	104	104			
WRASSES	23	37			12	72	24			
HOGFISH	68577	49570	46390	58230	68716	291483	58297	2.65%	35,671	94,248
Finfish Total =						8,661,145	1,671,478		1,027,303	2,698,782
LOBSTER										
LOBSTER,SPOTTED SPINY		3				3	3			
LOBSTER,SPINY	283752	298924	327560	257120	285413	1452769	290554	13.14%	176,933	467,489
CONCH										
CONCH	238648	260955	214100	280313	248169	1246186	249237	11.27%	151,773	401,010
GranTot =						11,360,103	2,211,272	100.0%	1,356,009	3,567,281

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (From MRFSS web page)

Year: 2000

Weights are for Catch Type A + B1 only				
Species	State Waters		EEZ	
	Weight (lbs)	PSE	Weight (lbs)	PSE
BARRACUDAS				
BARRACUDAS	118,563	48.7		
-- Species Group Subtotal --	118,563	48.7		
CARTILAGINOUS FISHES				
OTHER SHARKS	11,554	0		
SKATES/RAYS	17,059	0		
-- Species Group Subtotal --	28,614	0		
DOLPHINS				
DOLPHINS	1,034,700	23.7		
-- Species Group Subtotal --	1,034,700	23.7		
DRUMS				
ATLANTIC CROAKER	2,930	66.6		
KINGFISHES	0	0		
OTHER DRUM	1,468	40		
RED DRUM	0	0		
-- Species Group Subtotal --	4,398	46.3		
EELS				
EELS	0	0		
-- Species Group Subtotal --	0	0		
FLOUNDERS				
OTHER FLOUNDERS	86	0		
-- Species Group Subtotal --	86	0		
GRUNTS				
OTHER GRUNTS	27,031	20.9		
WHITE GRUNT	3,668	64		
-- Species Group Subtotal --	30,699	19.9		
HERRINGS				
HERRINGS	64,826	94.6		
-- Species Group Subtotal --	64,826	94.6		
JACKS				
BLUE RUNNER	2,172	20.7	0	0
CREVALLE JACK	32,573	58.3		
FLORIDA POMPAÑO	86	0		
GREATER AMBERJACK	27,022	48.6	1041	
OTHER JACKS	31,535	14.4	2683	65.5
-- Species Group Subtotal --	93,387	25.2	3724	
MULLETS				
MULLETS	9,182	36.6		
-- Species Group Subtotal --	9,182	36.6		
OTHER FISHES				
OTHER FISHES	602,464	59	21058	39.6

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

Species	State Waters		EEZ	
	Weight (lbs)	PSE	Weight (lbs)	PSE
-- Species Group Subtotal --	602,464	59	21058	39.6
PORGIES				
OTHER PORGIES	2,970	50.1	730	0
-- Species Group Subtotal --	2,970	50.1	730	0
PUFFERS				
PUFFERS	5,280	33.4		
-- Species Group Subtotal --	5,280	33.4		
SEA BASSES				
EPINEPHELUS GROUPERS	23,849	22.6	13441	21.8
OTHER SEA BASSES	17,260	30.2	2394	64.3
-- Species Group Subtotal --	41,109	18.3	15835	20.9
SEAROBINS				
SEAROBINS	0	0		
-- Species Group Subtotal --	0	0		
SNAPPERS				
GRAY SNAPPER	653	0	0	
LANE SNAPPER	86,841	38.8	0	
OTHER SNAPPERS	323,582	22.8	33137	74.4
RED SNAPPER	6,953	74.1	0	
VERMILION SNAPPER	3,728	57.1	313	
YELLOWTAIL SNAPPER	16,790	33.8	0	
-- Species Group Subtotal --	438,548	18.6	33450	73.7
TRIGGERFISHES/FILEFISHES				
TRIGGERFISHES/FILEFISHES	81,718	35.3	5395	
-- Species Group Subtotal --	81,718	35.3		
TUNAS AND MACKERELS				
KING MACKEREL	48,166	37.3		
LITTLE TUNNY/ATLANTIC BONITO	17,740	60.5		
OTHER TUNAS/MACKERELS	171,350	24.5		
SPANISH MACKEREL	0	0		
-- Species Group Subtotal --	237,257	19.8		
WRASSES				
OTHER WRASSES	3,100	32.9	518	
-- Species Group Subtotal --	3,100	32.9	518	
-- Grand Total --	2,796,901	16.1		

Year: 2001

Weights are for Catch Type A + B1 only				
Species	State Waters		EEZ	
	Weight (lbs)	PSE	Weight (lbs)	PSE
BARRACUDAS				
BARRACUDAS	91,273	21.8		
-- Species Group Subtotal --	91,273	21.8		
CARTILAGINOUS FISHES				
OTHER SHARKS	11,510	0		
SKATES/RAYS	6,431	0		

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

Species	State Waters		EEZ	
	Weight (lbs)	PSE	Weight (lbs)	PSE
-- Species Group Subtotal --	17,941	0		
DOLPHINS				
DOLPHINS	302,484	36.1		
-- Species Group Subtotal --	302,484	36.1		
DRUMS				
OTHER DRUM	5,379	44.3		
-- Species Group Subtotal --	5,379	44.3		
EELS				
EELS	3,375	0		
-- Species Group Subtotal --	3,375	0		
FLOUNDERS				
OTHER FLOUNDERS	983	0		
-- Species Group Subtotal --	983	0		
GRUNTS				
OTHER GRUNTS	13,199	32.2	174	
PIGFISH	0	0	0	
WHITE GRUNT	7,441	33.4	185	
-- Species Group Subtotal --	20,639	23.9	359	
HERRINGS				
HERRINGS	13,874	44.8		
-- Species Group Subtotal --	13,874	44.8		
JACKS				
BLUE RUNNER	30,291	32.4	282	
CREVALLE JACK	155,559	45.8		
GREATER AMBERJACK	0	0		
OTHER JACKS	58,933	19.6	5516	
-- Species Group Subtotal --	244,783	29.7	5798	
MULLETS				
MULLETS	15,108	68.5		
-- Species Group Subtotal --	15,108	68.5		
OTHER FISHES				
OTHER FISHES	485,894	62.3	37954	
-- Species Group Subtotal --	485,894	62.3		
PORGIES				
OTHER PORGIES	0	0	174	
SHEEPSHEAD	362	0		
-- Species Group Subtotal --	362	0	174	
PUFFERS				
PUFFERS	571	0		
-- Species Group Subtotal --	571	0		
SEA BASSES				
EPINEPHELUS GROUPERS	50,077	25.2	4857	
MYCTEROPERCA GROUPERS	1,986	0		
OTHER SEA BASSES	18,109	36.5	381	
-- Species Group Subtotal --	70,172	20.3	5238	

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

Species	State Waters		EEZ	
	Weight (lbs)	PSE	Weight (lbs)	PSE
SNAPPERS				
GRAY SNAPPER	483	0	0	
LANE SNAPPER	24,749	31.3	3796	
OTHER SNAPPERS	126,222	17	16757	
RED SNAPPER	0	0	0	
VERMILION SNAPPER	22,165	3.5	12635	
YELLOWTAIL SNAPPER	31,477	32.4	0	
-- Species Group Subtotal --	205,096	12.2	33188	
TRIGGERFISHES/FILEFISHES				
TRIGGERFISHES/FILEFISHES	58,700	25.9	12236	
-- Species Group Subtotal --	58,700	25.9	12236	
TUNAS AND MACKERELS				
KING MACKEREL	20,906	56.2		
LITTLE TUNNY/ATLANTIC BONITO	1,184	83.9		
OTHER TUNAS/MACKERELS	122,660	35.4		
SPANISH MACKEREL	2,231	0		
-- Species Group Subtotal --	146,981	30.6		
WRASSES				
OTHER WRASSES	11,288	34.1	196	
-- Species Group Subtotal --	11,288	34.1	196	
-- Grand Total --	1,694,903	19.8		

Table 3.14. Categories of habitat damage by fishing gear

Rankings

3 – High: Capable of severe damage to a wide area of habitat during a single encounter. Seriously impairs the function (for fish) of the impacted habitat.

2 – Moderate: Capable of severe damage to habitat in a relatively limited area during a single encounter; or capable of moderate damage to habitat over a wider area. Impairs the function (for fish) of the habitat.

1 – Minor: Capable of moderate damage to habitat in a limited area during a single encounter. May impair the function (for fish) of the habitat.

0 – Negligible: Does not typically cause damage. No perceptible impairment to the function (for fish) of the habitat.

Table 3.15. (a) *Fishing Gear Sensitivity*: Index of sensitivity of habitats to fishing gears in the U.S. Caribbean

Gear	Habitat										
	Coral	Hard Bottom	Benthic Algae	SAV	Sand-Shell	Mangrove	Soft Bottom	Wetland	Drift Algae	Rubble	Shoal-Banks
Trawl	3	2	2	2	2	0	2	0	0	1	1
Trap/Pot	2	2	2	2	0	0	0	0	0	0	0
Gill/Trammel Net	2	1	1	1	1	0	0	0	0	0	0
Hand Harvest	2	2	0	0	0	0	0	0	0	0	0
Beach Seine	2	2	1	1	0	0	0	0	0	0	0
Longline	1	1	0	0	0	0	0	0	0	0	0
Vertical Gear	1	1	0	0	0	0	0	0	0	0	0
Powerhead	1	1	0	0	0	0	0	0	0	0	0
Spears	1	1	0	0	0	0	0	0	0	0	0
Cast net	1	1	0	0	0	0	0	0	0	0	0
Slurp Gun	0	0	0	0	0	0	0	0	0	0	0
Dip net	0	0	0	0	0	0	0	0	0	0	0
Pelagic Longline	0	0	0	0	0	0	0	0	0	0	0
<div>0 = None</div> <div>1 = Low</div> <div>2 = Moderate</div> <div>3 = High</div>											

Table 3.15. (b) *Fishing Effort Index*: Relative use of fishing gears on habitats in the U.S. Caribbean EEZ

Gear	Habitat										
	Coral	Hard Bottom	Benthic Algae	SAV	Sand-Shell	Mangrove	Soft Bottom	Wetland	Drift Algae	Rubble	Shoal-Banks
Trawl	0	0	0	0	0	0	0	0	0	0	0
Trap/Pot	2	3	3	3	3	0	2	0	0	3	3
Gill/Trammel Net	2	2	2	3	3	0	1	0	0	3	3
Hand Harvest	2	2	2	2	2	0	2	0	0	2	2
Beach Seine	0	0	0	0	0	0	0	0	0	0	0
Longline	1	2	1	1	1	0	1	0	0	2	2
Vertical Gear	2	3	1	0	1	0	0	0	0	3	3
Powerhead	0	0	0	0	0	0	0	0	0	0	0
Spears	2	2	1	0	0	0	0	0	0	2	2
Cast net	0	0	0	0	0	0	0	0	0	0	0
Slurp Gun	1	1	0	0	0	0	0	0	0	1	1
Dip net	1	1	0	0	0	0	0	0	0	1	1
<div>0 = None</div> <div>1 = Low</div> <div>2 = Moderate</div> <div>3 = High</div>											

Table 3.16. NOAA Fisheries review of habitat alteration projects in Puerto Rico and the US Virgin Islands, 1981-June 2002.

Acres of habitat alterations requested by type of projects reviewed in Puerto Rico and the U.S. Virgin Islands between 1981 and June 2002

Project Type	N1	N2	Acreage Proposed By Applicants	Acreage Accepted By NMFS	Acreage Potentially Conserved	Acreage Mitigated
BA	49	-	-	-	-	-
BE	17	1	1.9	1.9	0.0	0.0
BR	110	7	110.7	17.1	93.6	10.6
DO	667	3	0.5	0.0	0.5	0.0
EL	3	-	-	-	-	-
HO	361	29	325.2	21.7	303.5	46.6
IN	324	35	375.0	97.1	277.8	106.5
IR	28	2	9.2	0.0	9.2	0.0
MD	246	6	32.4	18.9	13.4	0.0
MI	16	2	4.0	2.0	2.0	0.0
NA	197	29	402.8	134.1	268.7	67.2
OI	4	-	-	-	-	-
OT	118	9	130.7	25.3	105.4	0.7
PI	52	1	0.2	0.2	0.0	0.2
SH	457	33	168.7	30.6	138.0	134.3
TR	21	1	1.2	0.0	1.2	0.0
WR	4	-	-	-	-	-
Total	2,674	158	1,563.1	349.3	1,213.8	366.3

(BA) barriers and impoundments; (BE) beach nourishment projects; (BR) bridges, roads, and causeways; (DO) docks and other minor structures; (HO) housing developments; (IN) commercial and industrial developments; etc.; (IR) irrigation and drainage works; (MD) maintenance dredging; (MI) mining and mineral exploration; (MM) marsh management areas; (NA) navigation projects, marinas, etc.; (OI) oil and gas construction; (OT) unclassified; (PI) oil, gas, and chemical pipelines; (SH) bulkheads, small fills, groins, etc.; (TR) transmission lines; (WR) wetland restoration projects.

N1 = Total number of projects reviewed.

N2 = Number of projects where acreage was determined.

Table 3.16. Acres of habitat alterations proposed in Puerto Rico and the U.S. Virgin Islands between 1981 and June 2002 by habitat type. (continued)

Dominant Habitat	N	Acreage Proposed For Alteration	Acreage Accepted By NMFS	Acreage Potentially Conserved	Acreage Mitigated
black mangrove	48	204.2	2.5	201.7	8.8
algae	9	20.2	14.9	5.3	0.0
fresh marsh	21	62.0	23.8	38.2	27.2
freshwater submerged aquatic vegetation	1	0.0	0.0	0.0	0.0
shoal grass	2	4.0	0.0	4.0	0.0
Halophila	3	6.2	2.0	4.2	2.0
hardwood swamp	2	1.5	0.4	1.1	7.6
white mangrove	26	149.6	0.2	149.4	1.2
miscellaneous	10	117.6	20.9	96.7	5.2
mud substrate	14	155.4	79.5	75.9	43.2
other marsh	15	86.9	2.0	84.9	0.0
reef	2	10.5	0.0	10.5	0.0
red mangrove	50	302.4	3.7	298.7	158.2
rock substrate	4	6.5	3.8	2.7	0.0
sand substrate	49	244.6	167.1	77.5	6.5
silt substrate	2	70.1	10.5	59.6	0.0
manatee grass	5	2.6	1.6	1.0	1.7
turtle grass	24	118.8	16.4	102.4	104.7
Total	287	1,563.1	349.3	1,213.8	366.3

Table is based on a sample of 158 projects.

Table 3.17. Number of projects reviewed yearly by the NOAA Fisheries Southeast Region, 1982 through 2001

<u>CALENDAR YEAR</u>	<u>U.S. VIRGIN ISLANDS</u>	<u>PUERTO RICO</u>	<u>TOTAL</u>
1982	12	60	72
1983	8	44	52
1984	4	73	77
1985	30	60	90
1986	11	119	130
1987	16	123	139
1988	15	233	248
1989	13	228	241
1990	6	127	133
1991	31	92	123
1992	14	80	94
1993	12	78	90
1994	13	80	93
1995	12	76	88
1996	9	113	122
1997	38	216	254
1998	17	113	130
1999	33	126	159
2000	27	91	118
2001	10	105	115

Table 3.18 Summary of concerns about natural and anthropogenic pressures on coral reef ecosystems in the US Caribbean based on priorities of reef managers

	Puerto Rico	U.S. Virgin Islands
Global warming and bleaching	M	M
Diseases	H	H
Tropical storms	L	H
Coastal development and runoff	H	H
Coastal pollution	H	H
Tourism and recreation	M	M
Trade in coral and live reef species	H	L
Ships, boats, and groundings	M	H
Marine debris	M	L
Alien species	L	L
Other physical impacts	H	L
Offshore oil and gas exploration	L	L

H = High concern; M = Medium concern; L = Little to no concern

Based on Turgeon et al. (2002)

Table 4.1 Fishing threat analysis for Caribbean fish habitats

FMP	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
Reef							
Fish	Pot/trap	Marine Reef	2	2	4	4	16
		Marine Hard Bot	2	3	6	4	24
		Marine Sand/sh	0	3	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	2	3	6	4	24
		Estuar Seagr	2	1	2	3	6
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	3	0	2	0
		Marine Soft Bot	0	2	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	1	0	1	0
		Estuar Soft Bot	0	1	0	1	0
		Marine Ben Alg	2	3	6	2	12
		Marine Drift Alg	0	0	0	1	0
	Longline	Marine Reef	1	1	1	4	4
		Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	0	1	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	1	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	2	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	1	0	2	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

FMP	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
Reef Fish	Longline	Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	1	0	2	0
		Marine Drift Alg	0	0	0	1	0
	Vertical Gear	Marine Reef	1	2	2	4	8
		Marine Hard Bot	1	3	3	4	12
		Marine Sand/sh	0	1	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	0	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	3	0	2	0
		Marine Soft Bot	0	0	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	2	0	2	0
		Marine Drift Alg	0	0	0	1	0
	Beach seine	Marine Seagr	1	0	0	4	0
		Estuar Seagr	1	0	0	3	0
		Marine Ben Alg	1	0	0	2	0
	Gill / Trammel net	Marine Reef	2	2	4	4	16
		Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	1	3	3	4	12
		Marine Pelagic	0	0	0	3	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

FMP	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
Queen Conch	Hand harvest	Marine Seagr	1	3	3	4	12
		Estuar Seagr	1	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	1	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	1	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	1	2	2	2	4
		Marine Drift Alg	0	0	0	1	0
		Spear Marine Reef	1	2	2	4	8
		Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	0	0	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	0	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	2	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	0	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	1	0	2	0
		Marine Drift Alg	0	0	0	1	0
		Marine Seagr	0	2	0	4	0
		Marine Sand/Sh	0	2	0	4	0
		Marine Ben Alg	0	2	0	3	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

FMP	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
		Marine Hard bot	0	2	0	3	0
		Marine Reef	0	2	0	2	0
		Estuar Seagr	0	1	0	2	0
		Marine Pelagic	0	0	0	1	0
		Marine Rubble	0	2	0	1	0
Spiny							
Lobster	Pot/Trap	Marine Reef	2	2	4	4	16
		Marine Seagr	2	3	6	4	24
		Estuar Seagr	2	1	2	3	6
		Marine Hard bot	2	3	6	3	18
		Marine Ben Alg	2	3	6	2	12
		Marine Pelagic	0	0	0	2	0
		Estuar Ben Alg	2	2	4	1	4
		Estuar Mangr	0	0	0	1	0
		Marine Mangr	0	0	0	1	0
	Gill / Trammel						
	net	Marine Reef	2	2	4	4	16
		Marine Seagr	1	3	3	4	12
		Estuar Seagr	1	1	1	3	3
		Marine Hard bot	1	2	2	3	6
		Marine Ben Alg	1	1	1	2	2
		Marine Pelagic	0	0	0	2	0
		Estuar Ben Alg	1	2	2	1	2
		Estuar Mangr	0	0	0	1	0
		Marine Mangr	0	0	0	1	0
Coral	Hand	Marine Reef	2	1	2	4	8
		Marine Hard bot	2	1	2	4	8

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean

Habitat	FMP	Gear	Fishing Threat	Fishing Effort	Impact	Highest Ecol Impt	Rel Risk
Marine Seagr	Reef Fish, S Lobster, Q Conch	Pots/traps	2	3	6	4	24
Marine Hard Bot	Reef Fish, Coral	Pots/traps	2	3	6	4	24
Marine Ben Alg	Q Conch	Pots/traps	2	3	6	3	18
Marine Reef	Reef Fish, S Lobster, Coral	Pots/traps	2	2	4	4	16
Marine Reef	Reef Fish, S Lobster, Coral	Gill/Tram	2	2	4	4	16
Marine Seagr	Reef Fish, S Lobster, Q Conch	Gill/Tram	1	3	3	4	12
Marine Hard Bot	Reef Fish, Coral	Vert gear	1	3	3	4	12
Marine Sand/sh	Reef Fish, Q conch	Gill/Tram	1	3	3	4	12
Estuar Seagr	S Lobster	Pots/traps	2	1	2	4	8
Marine Hard Bot	Reef Fish, Coral	Gill/Tram	1	2	2	4	8
Marine Hard Bot	Reef Fish, Coral	Longline	1	2	2	4	8
Marine Hard Bot	Reef Fish, Coral	Spear	1	2	2	4	8
Marine Reef	Reef Fish, S Lobster, Coral	Spear	1	2	2	4	8
Marine Reef	Reef Fish, S Lobster, Coral	Vert gear	1	2	2	4	8
Estuar Ben Alg	S lobster	Pots/traps	2	2	4	2	8
Marine Hard Bot	Reef Fish, Coral	Hand	2	1	2	4	8
Marine Ben Alg	Lobster, Q Conch	Gill/Tram	1	2	2	3	6
Marine Reef	Reef Fish, S Lobster, Coral	Longline	1	1	1	4	4
Estuar Ben Alg	S lobster	Gill/Tram	1	2	2	2	4
Marine Sand/sh	Reef Fish, Q conch	Longline	0	1	0	4	0
Marine Ben Alg	Lobster, Q Conch	Longline	0	1	0	3	0
Marine Pelagic	Reef Fish	Gill/Tram	0	0	0	3	0
Marine Pelagic	Reef Fish	Hand	0	0	0	3	0
Marine Pelagic	Reef Fish	Longline	0	0	0	3	0
Marine Pelagic	Reef Fish	Pots/traps	0	0	0	3	0
Marine Pelagic	Reef Fish	Spear	0	0	0	3	0
Marine Pelagic	Reef Fish	Vert gear	0	0	0	3	0
Marine Reef	Reef Fish, S Lobster, Coral	Hand	0	2	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Hand	0	2	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Pots/traps	0	3	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Spear	0	0	0	4	0

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean Continued

Habitat	FMP	Gear	Fishing Threat	Fishing Effort	Impact	Highest Ecol Impt	Rel Risk
Marine Sand/sh	Reef Fish, Q conch	Vert gear	0	1	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Hand	0	2	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Longline	0	1	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Spear	0	0	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Vert gear	0	0	0	4	0
Estuar Mangr	Reef Fish	Gill/Tram	0	0	0	2	0
Estuar Mangr	Reef Fish	Longline	0	0	0	2	0
Estuar Mangr	Reef Fish	Pots/traps	0	0	0	2	0
Estuar Mangr	Reef Fish	Spear	0	0	0	2	0
Estuar Mangr	Reef Fish	Vert gear	0	0	0	2	0
Estuar Seagr	Lobster	Gill/Tram	1	0	0	4	0
Estuar Seagr	Lobster	Hand	0	1	0	4	0
Estuar Seagr	Lobster	Longline	0	0	0	4	0
Estuar Seagr	Lobster	Spear	0	0	0	4	0
Estuar Seagr	Lobster	Vert gear	0	0	0	4	0
Marine Ben Alg	Lobster, Q Conch	Hand	0	2	0	3	0
Marine Ben Alg	Lobster, Q Conch	Spear	0	1	0	3	0
Marine Ben Alg	Lobster, Q Conch	Vert gear	0	2	0	3	0
Marine Mangr	Reef Fish	Gill/Tram	0	0	0	3	0
Marine Mangr	Reef Fish	Hand	0	0	0	3	0
Marine Mangr	Reef Fish	Longline	0	0	0	3	0
Marine Mangr	Reef Fish	Pots/traps	0	0	0	3	0
Marine Mangr	Reef Fish	Spear	0	0	0	3	0
Marine Mangr	Reef Fish	Vert gear	0	0	0	3	0
Estuar Wetlands	Reef Fish	Gill/Tram	0	0	0	1	0
Estuar Wetlands	Reef Fish	Longline	0	0	0	1	0
Estuar Wetlands	Reef Fish	Pots/traps	0	0	0	1	0
Estuar Wetlands	Reef Fish	Spear	0	0	0	1	0
Estuar Wetlands	Reef Fish	Vert gear	0	0	0	1	0
Marine Rubble	Reef Fish	Gill/Tram	0	3	0	3	0
Marine Rubble	Reef Fish	Longline	0	2	0	3	0
Marine Rubble	Reef Fish	Pots/traps	0	3	0	3	0

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean Continued

Habitat	FMP	Gear	Fishing Threat	Fishing Effort	Impact	Highest Ecol Impt	Rel Risk
Marine Rubble	Reef Fish	Spear	0	2	0	3	0
Marine Rubble	Reef Fish	Vert gear	0	3	0	3	0
Marine Shoals	Reef Fish	Gill/Tram	0	2	0	2	0
Marine Shoals	Reef Fish	Longline	0	2	0	2	0
Marine Shoals	Reef Fish	Pots/traps	0	3	0	2	0
Marine Shoals	Reef Fish	Spear	0	2	0	2	0
Marine Shoals	Reef Fish	Vert gear	0	3	0	2	0
Marine Soft Bot	Reef Fish	Gill/Tram	0	1	0	2	0
Marine Soft Bot	Reef Fish	Longline	0	1	0	2	0
Marine Soft Bot	Reef Fish	Pots/traps	0	2	0	2	0
Marine Soft Bot	Reef Fish	Spear	0	0	0	2	0
Marine Soft Bot	Reef Fish	Vert gear	0	0	0	2	0
Estuar Ben Alg	S lobster	Hand	0	1	0	2	0
Estuar Ben Alg	S lobster	Longline	0	0	0	2	0
Estuar Ben Alg	S lobster	Spear	0	0	0	2	0
Estuar Ben Alg	S lobster	Vert gear	0	0	0	2	0
Estuar Sand/Sh	Reef Fish	Gill/Tram	1	0	0	1	0
Estuar Sand/Sh	Reef Fish	Longline	0	0	0	1	0
Estuar Sand/Sh	Reef Fish	Pots/traps	0	1	0	1	0
Estuar Sand/Sh	Reef Fish	Spear	0	0	0	1	0
Estuar Sand/Sh	Reef Fish	Vert gear	0	0	0	1	0
Estuar Soft Bot	Reef Fish	Gill/Tram	0	0	0	1	0
Estuar Soft Bot	Reef Fish	Longline	0	0	0	1	0
Estuar Soft Bot	Reef Fish	Pots/traps	0	1	0	1	0
Estuar Soft Bot	Reef Fish	Spear	0	0	0	1	0
Estuar Soft Bot	Reef Fish	Vert gear	0	0	0	1	0
Marine Drift Alg	Reef Fish	Gill/Tram	0	0	0	1	0
Marine Drift Alg	Reef Fish	Longline	0	0	0	1	0
Marine Drift Alg	Reef Fish	Pots/traps	0	0	0	1	0
Marine Drift Alg	Reef Fish	Spear	0	0	0	1	0
Marine Drift Alg	Reef Fish	Vert gear	0	0	0	1	0

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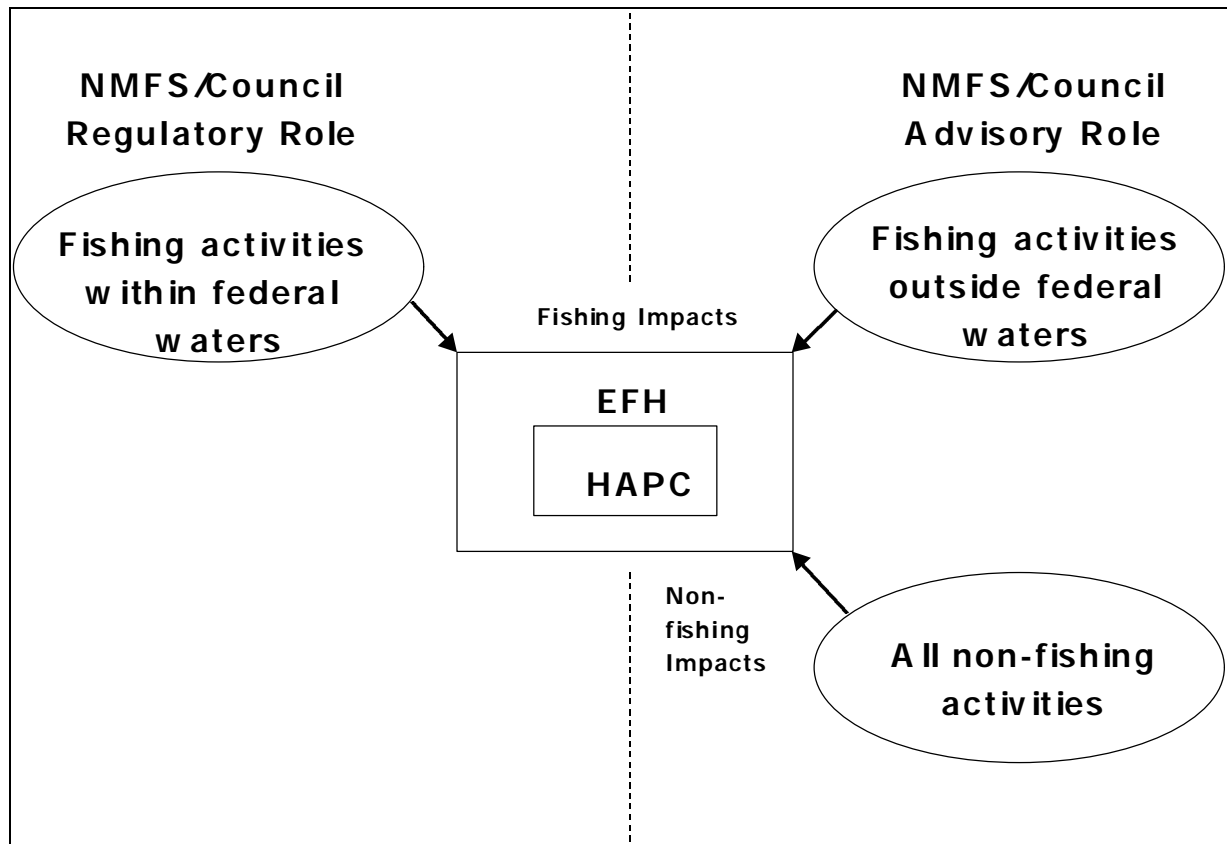


Figure 2.1. The regulatory and advisory roles of the Caribbean Council and NMFS related to essential fish habitat.

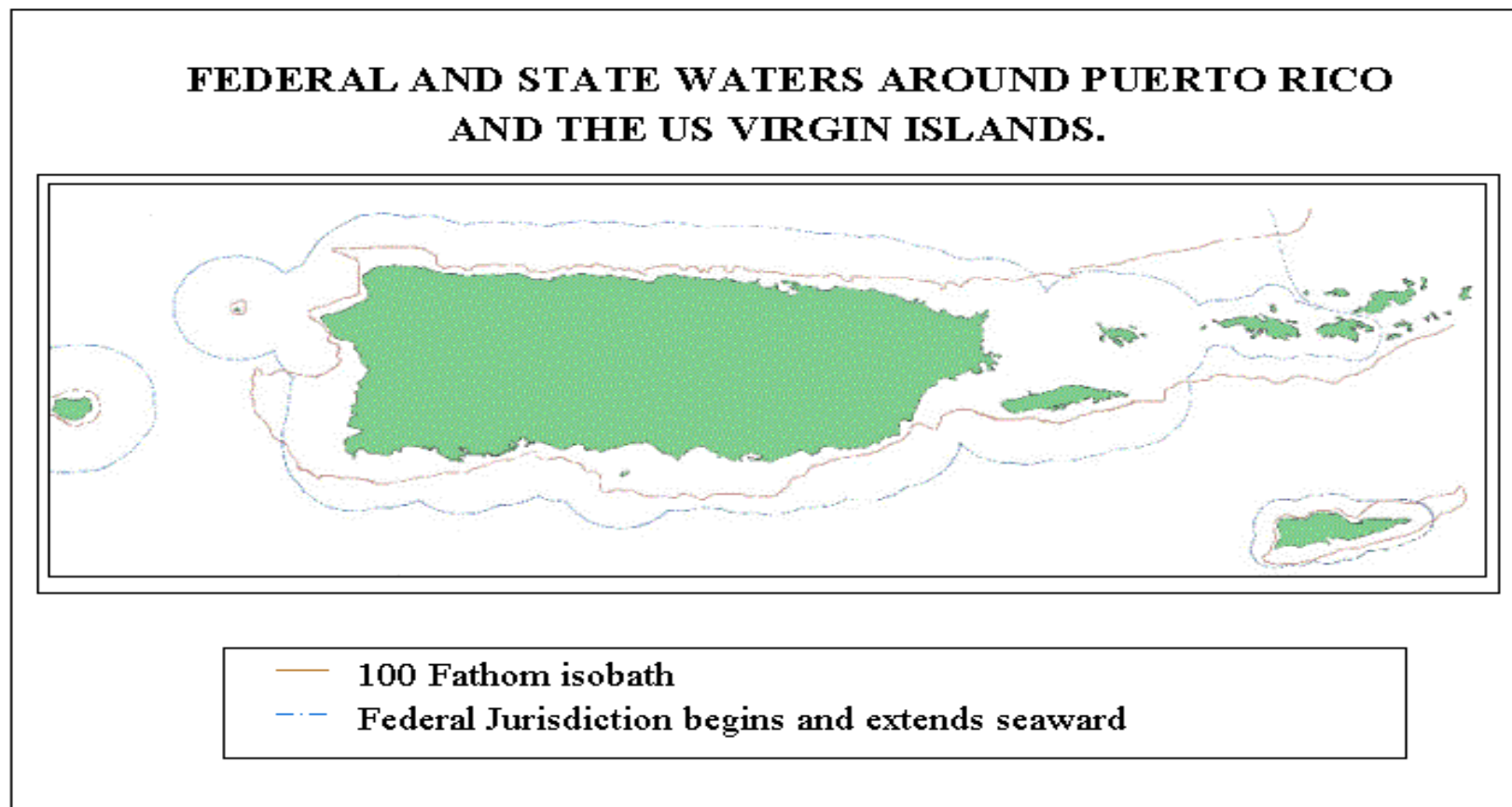


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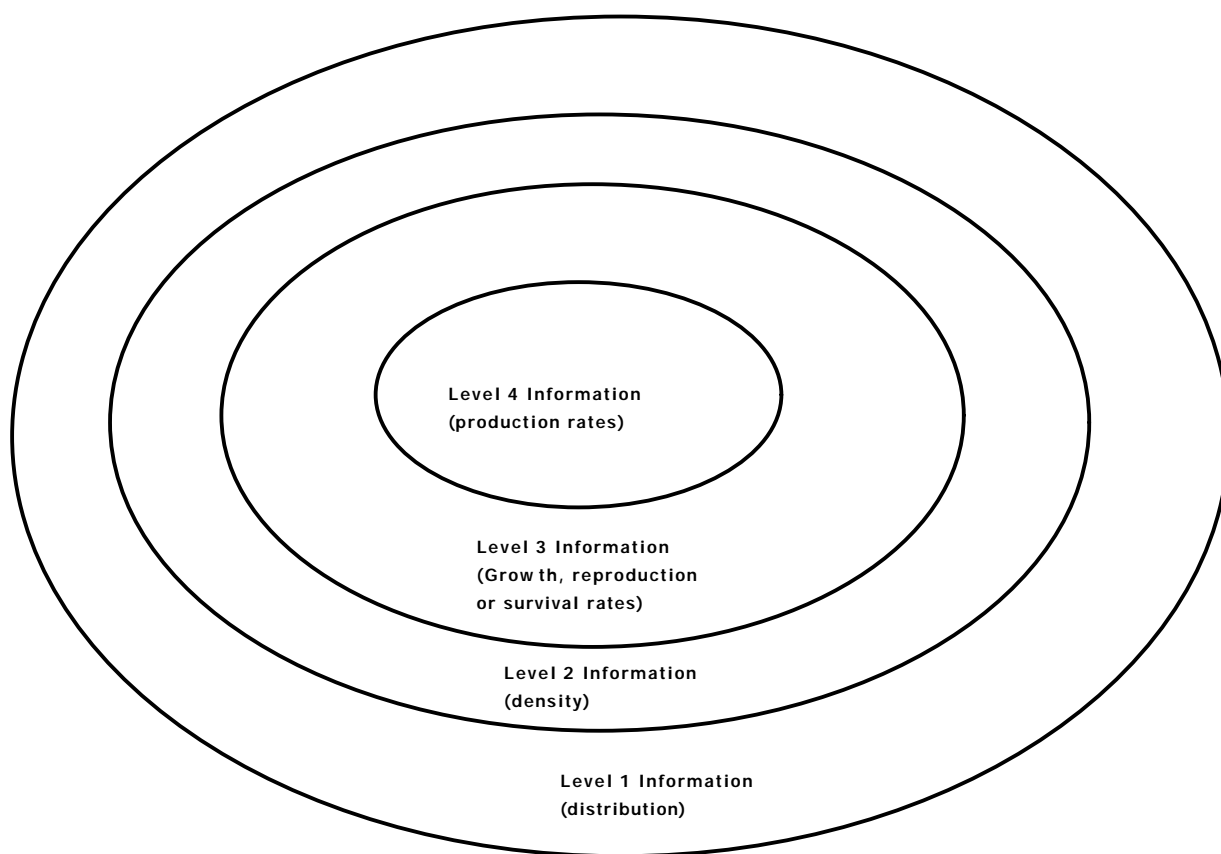


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Habitat Mapping Index
Puerto Rico and the U.S. Virgin Islands

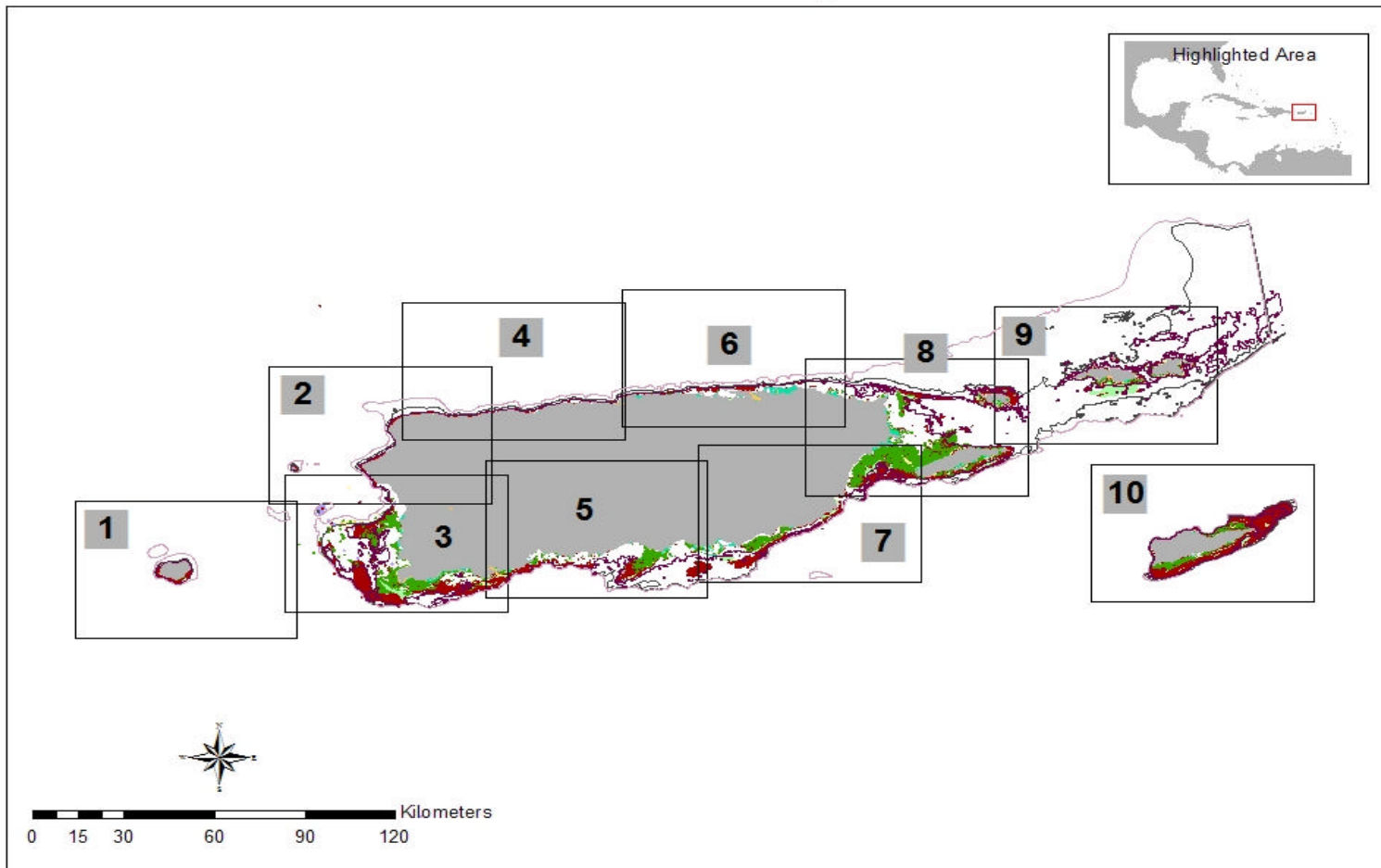


Figure 2.5. Index to habitat distribution mosaic maps (from Kendall et al. 2001)

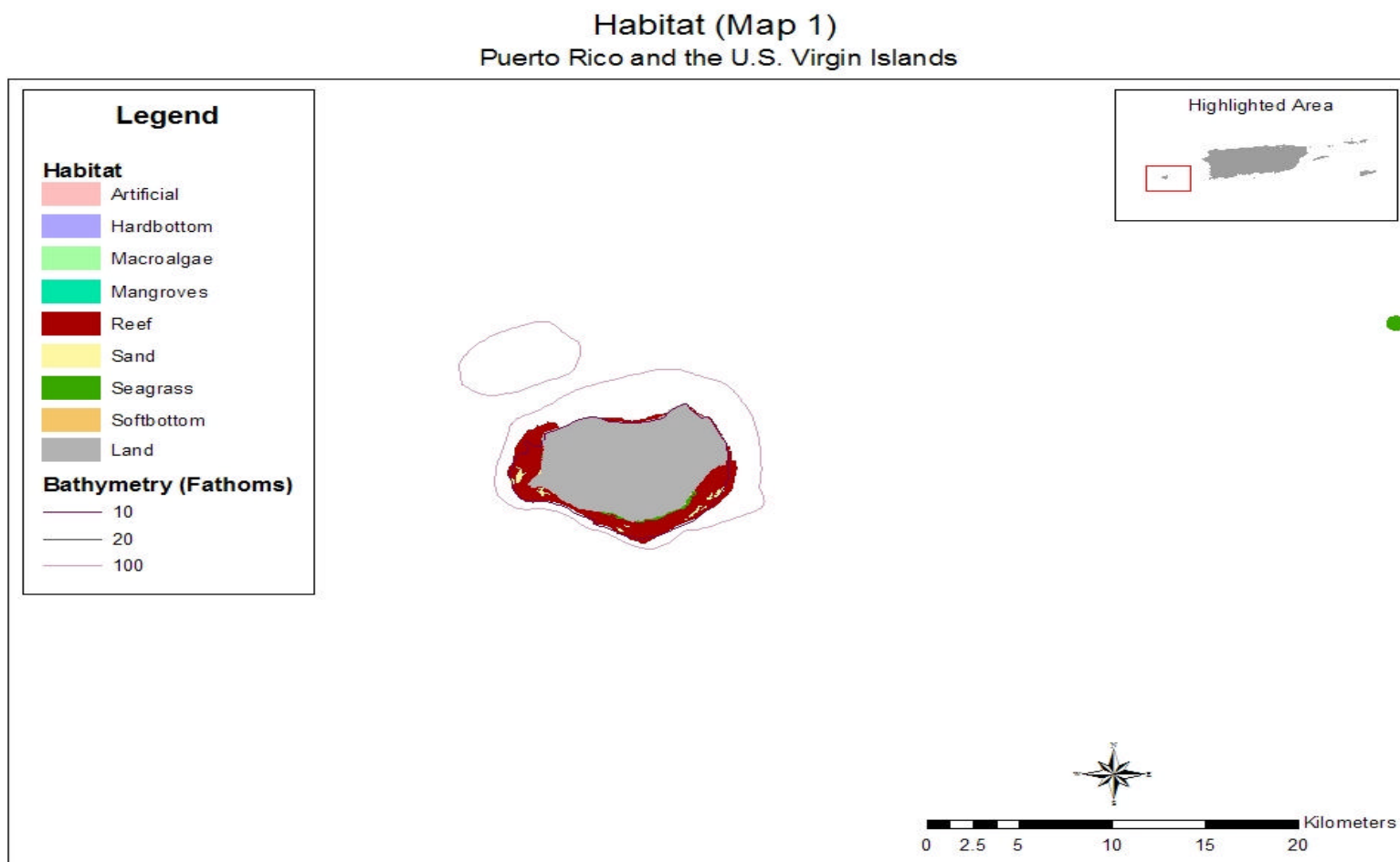


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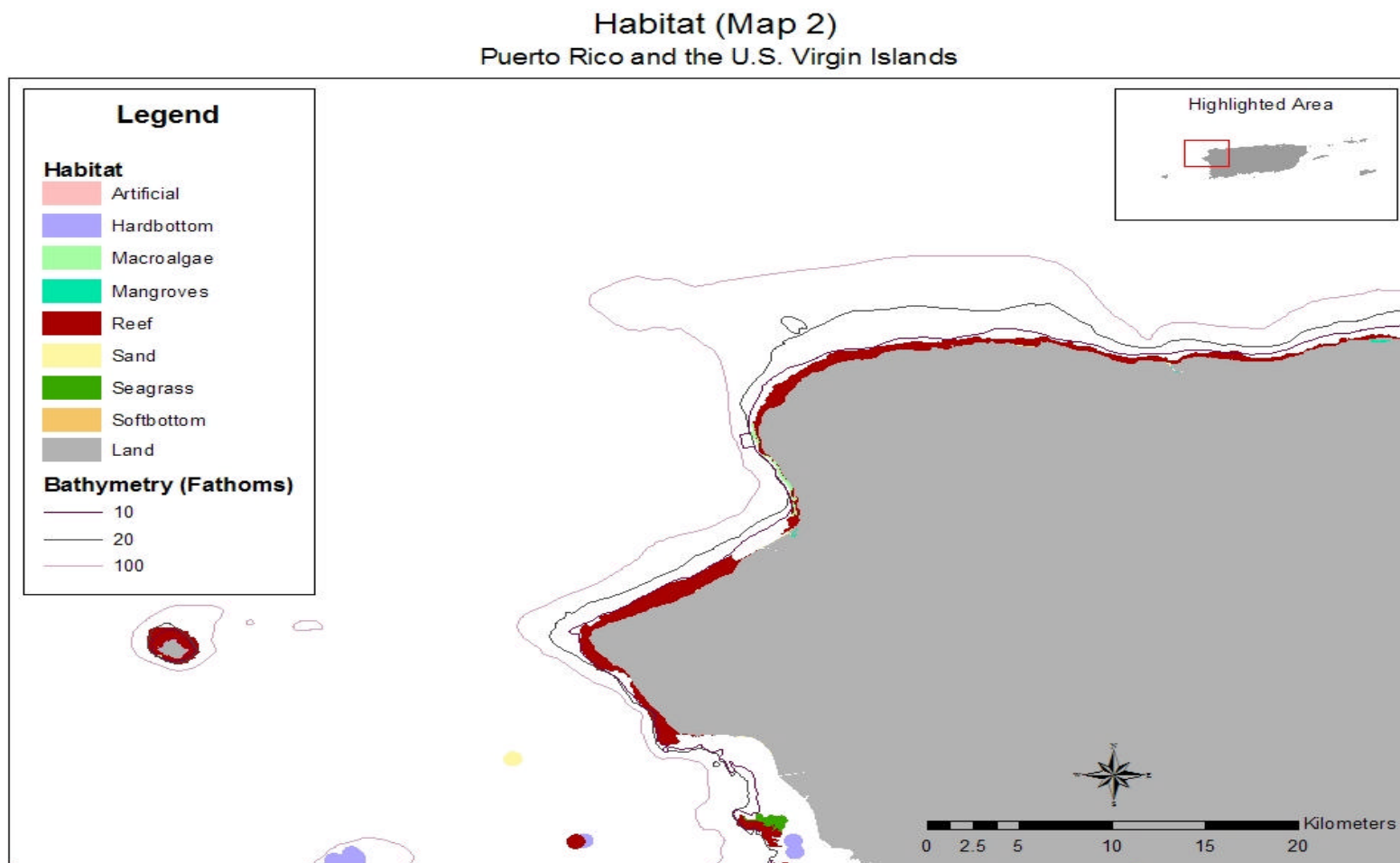


Figure 2.7. Mosaic map No. 2 for habitat distribution in the northwest of Puerto Rico (from Kendall et al. 2001). Colored circles are habitats derived from SEAMAP surveys, which may not accurately portray habitat.

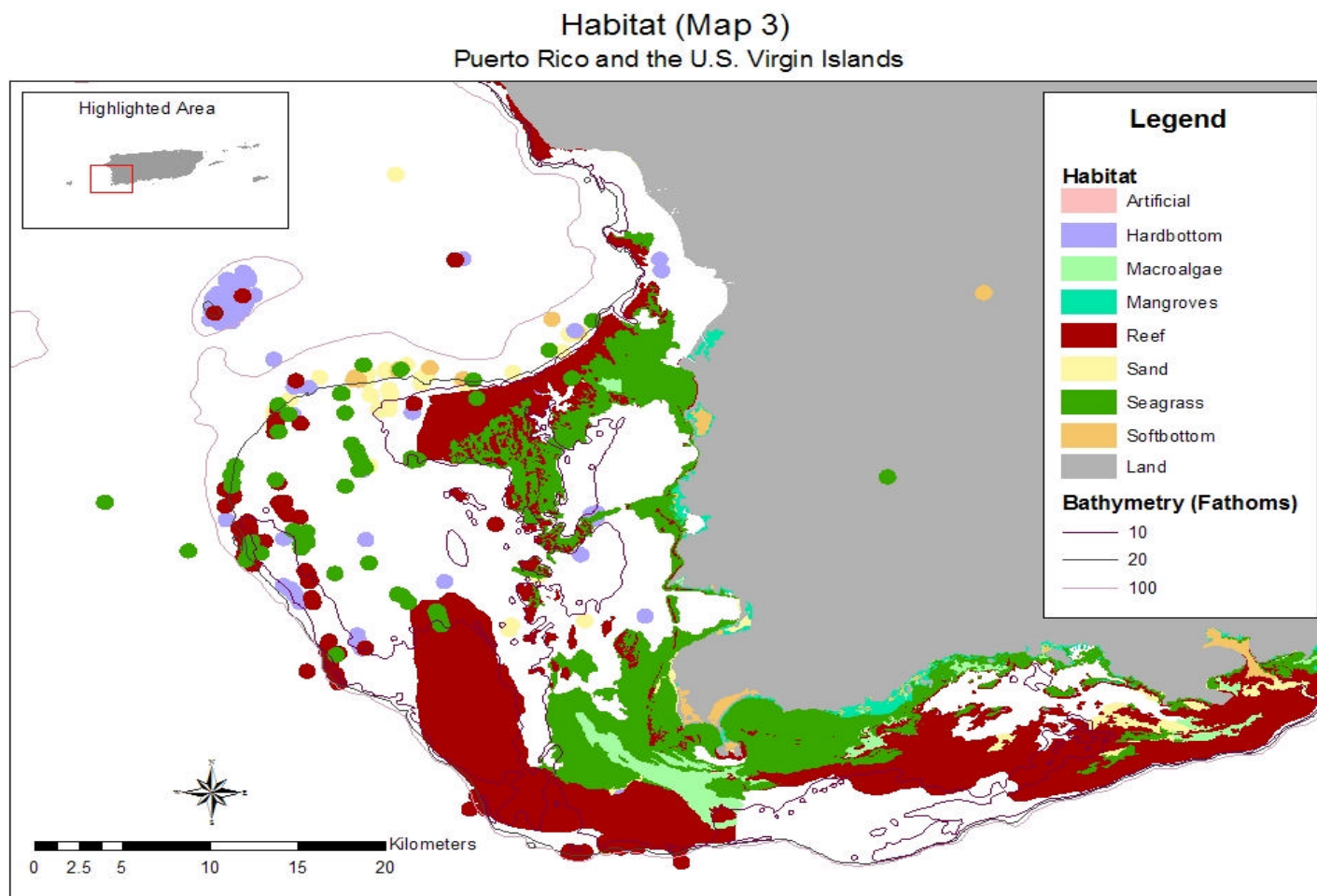


Figure 2.8. Mosaic Map No. 3 for habitat distribution in the southwest of Puerto Rico (from Kendall et al. 2001). Colored circles are habitats derived from SEAMAP surveys, which may not accurately portray habitat.

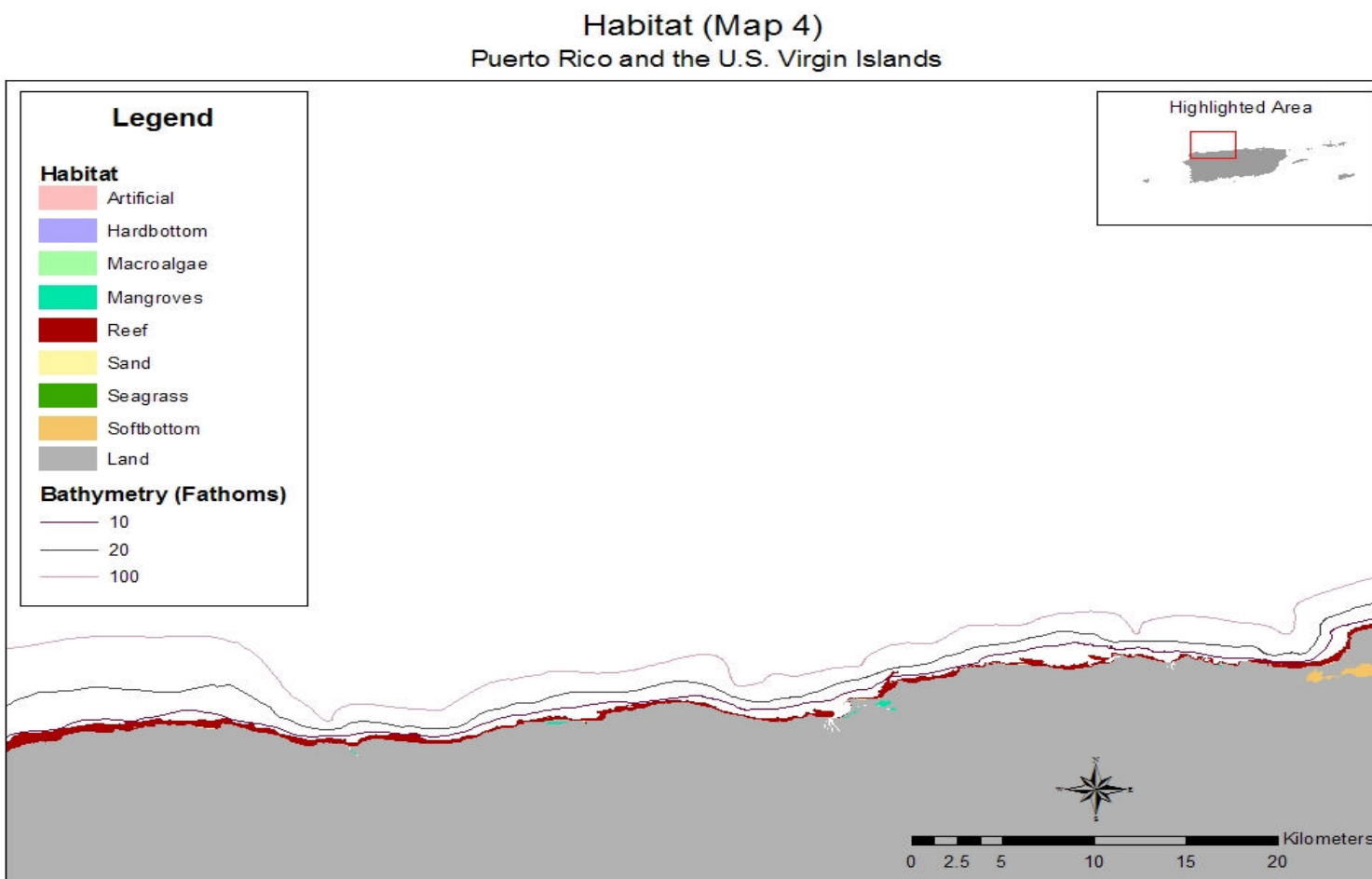


Figure 2.9. Mosaic map No. 4 for habitat distribution in the western region of the north shore of Puerto Rico (from Kendall et al. 2001)

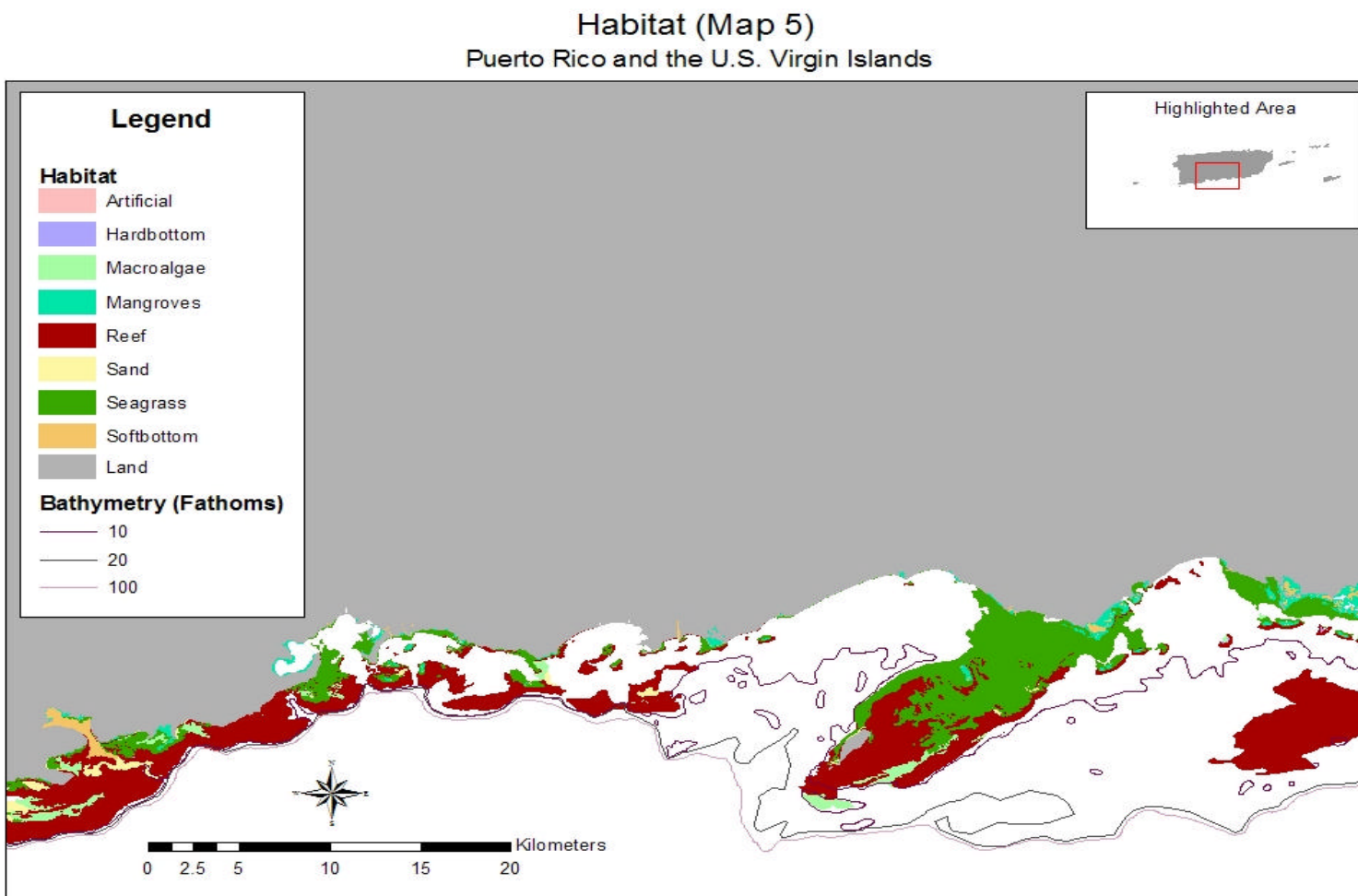


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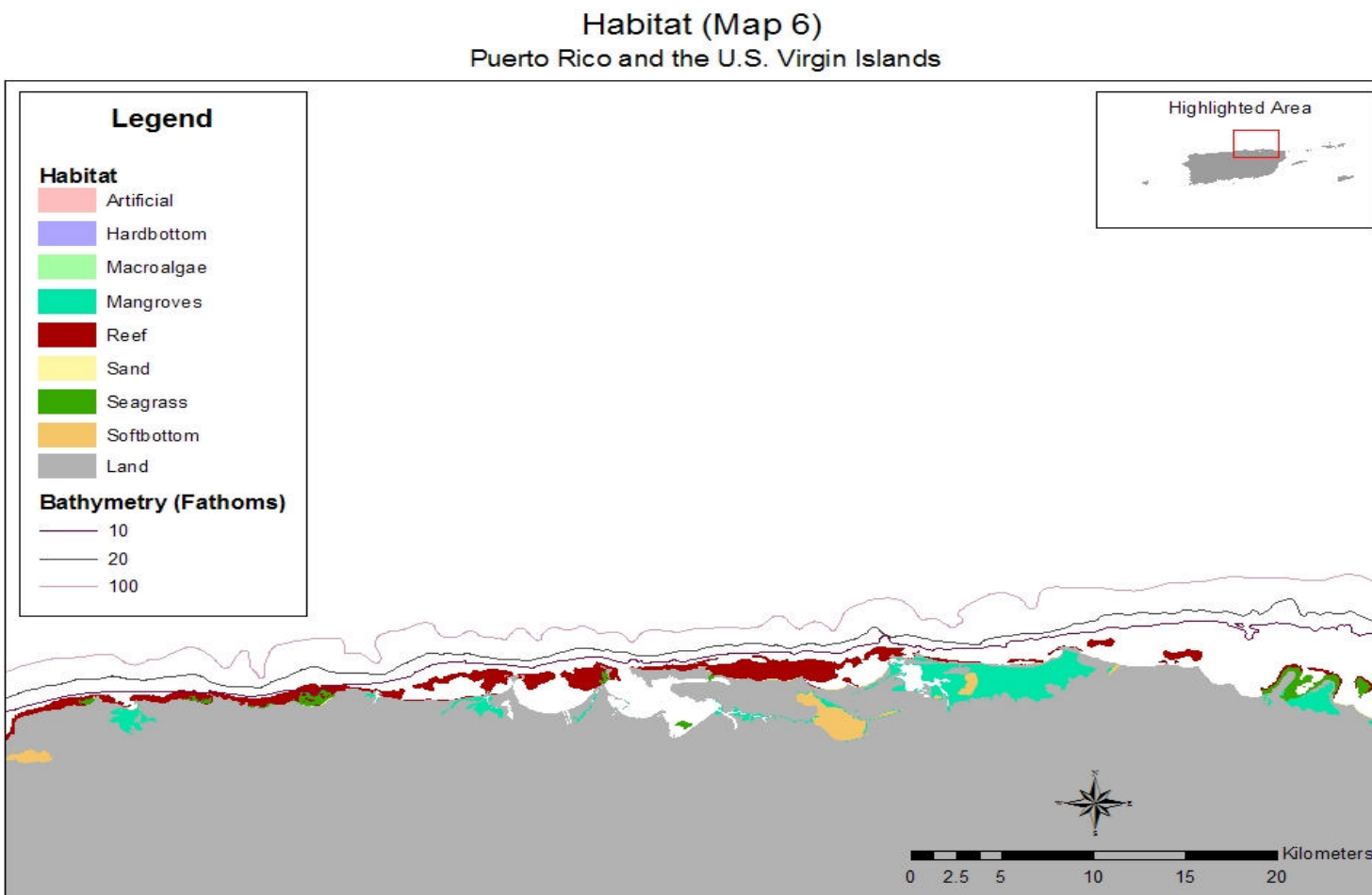


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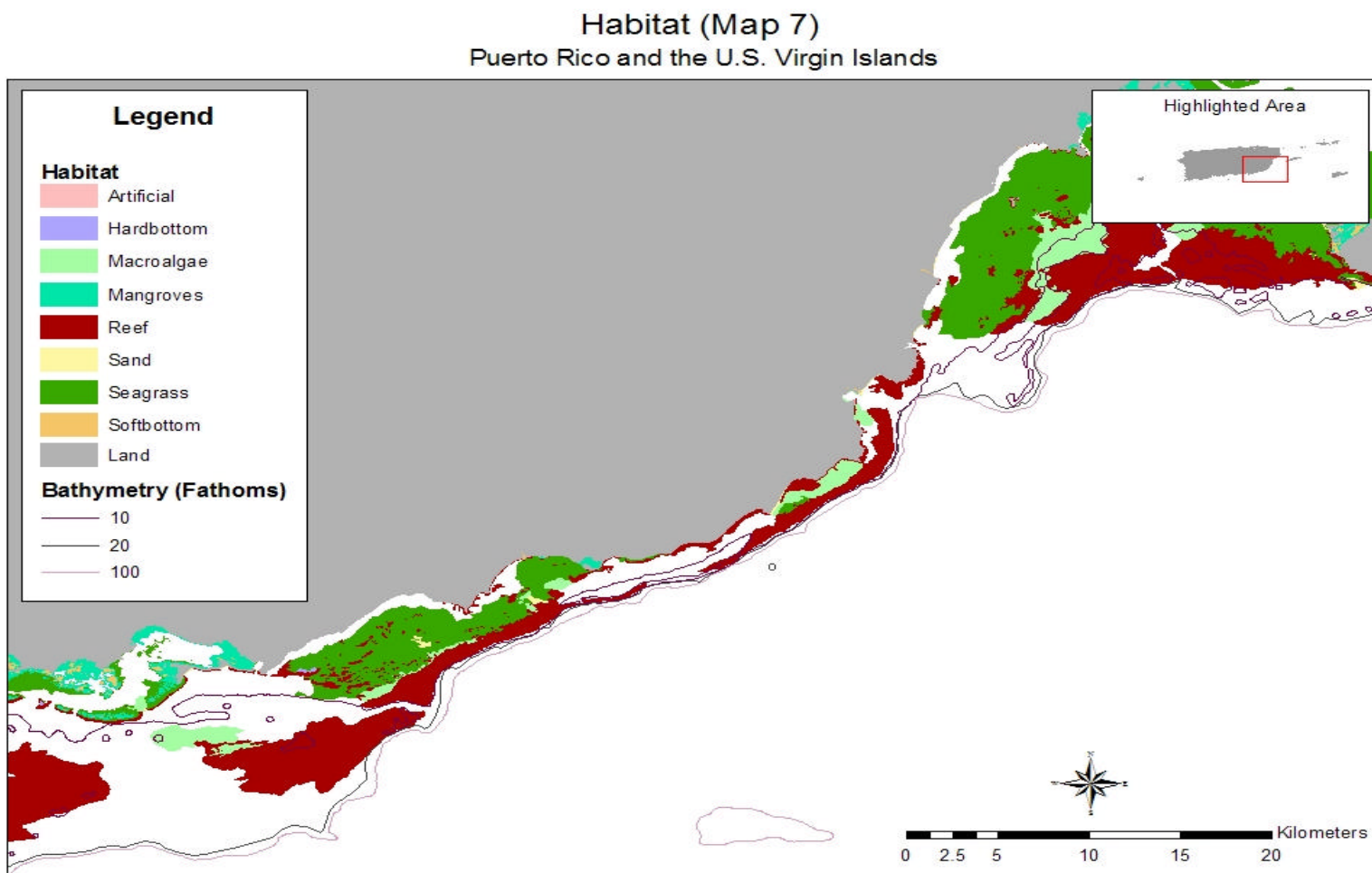


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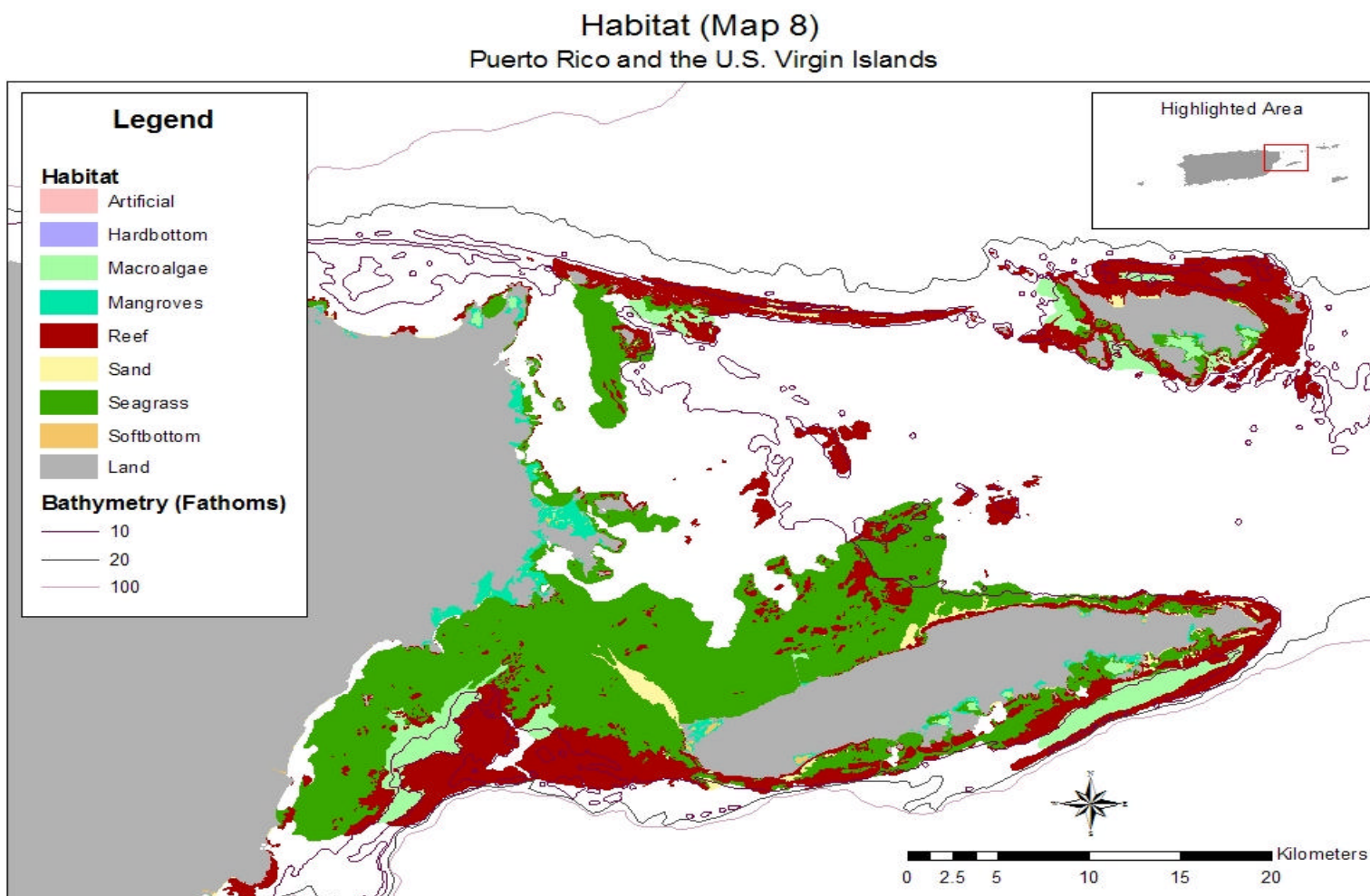


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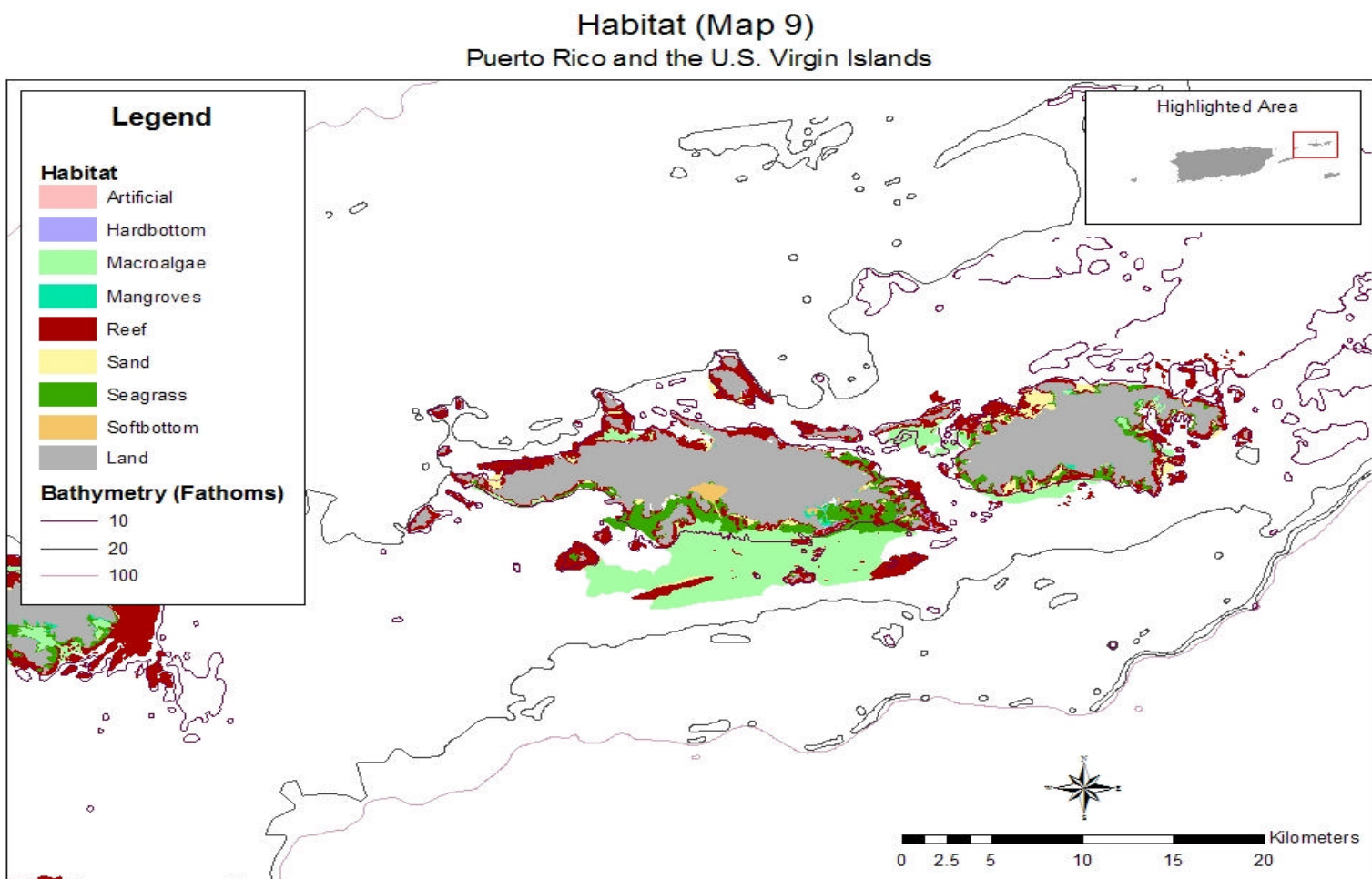


Figure 2.14. Mosaic map No. 9 for habitat distribution in St. Thomas and St. John (from Kendall et al. 2001)

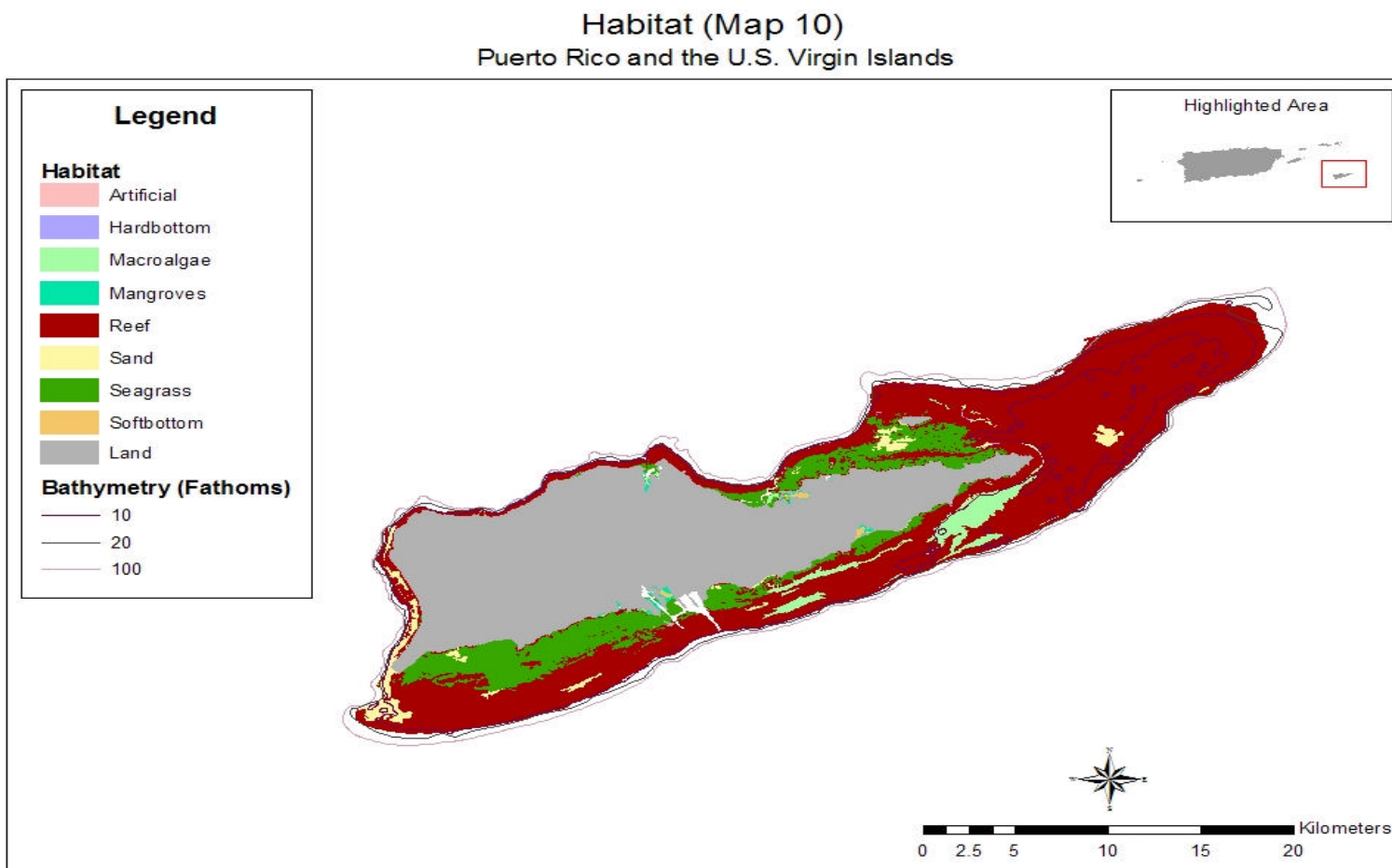


Figure 2.15. Mosaic map No. 10 for habitat distribution on St. Croix (from Kendall et al. 2001)

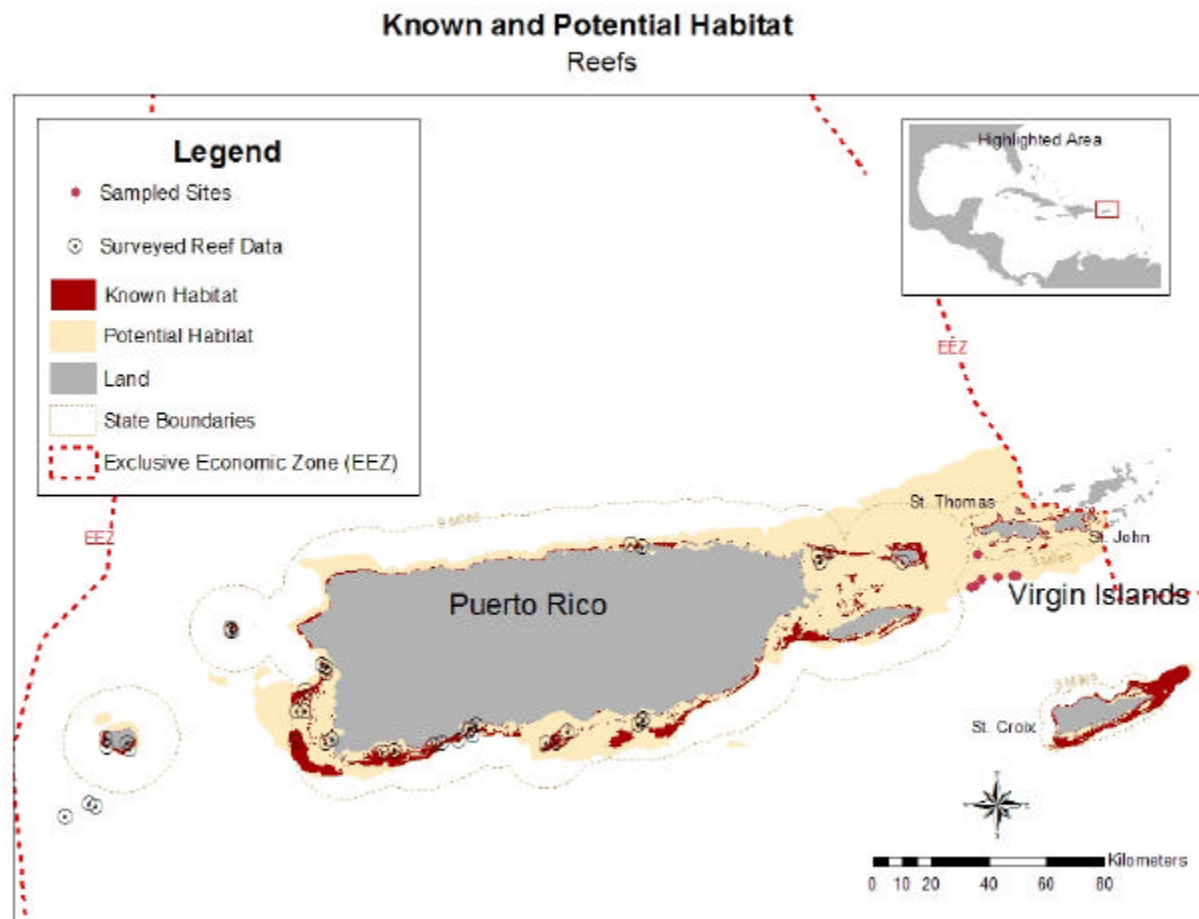


Figure 2.16. Known (from Kendall et al. 2001) and potential coral reef habitat for Puerto Rico and the US Virgin Islands.

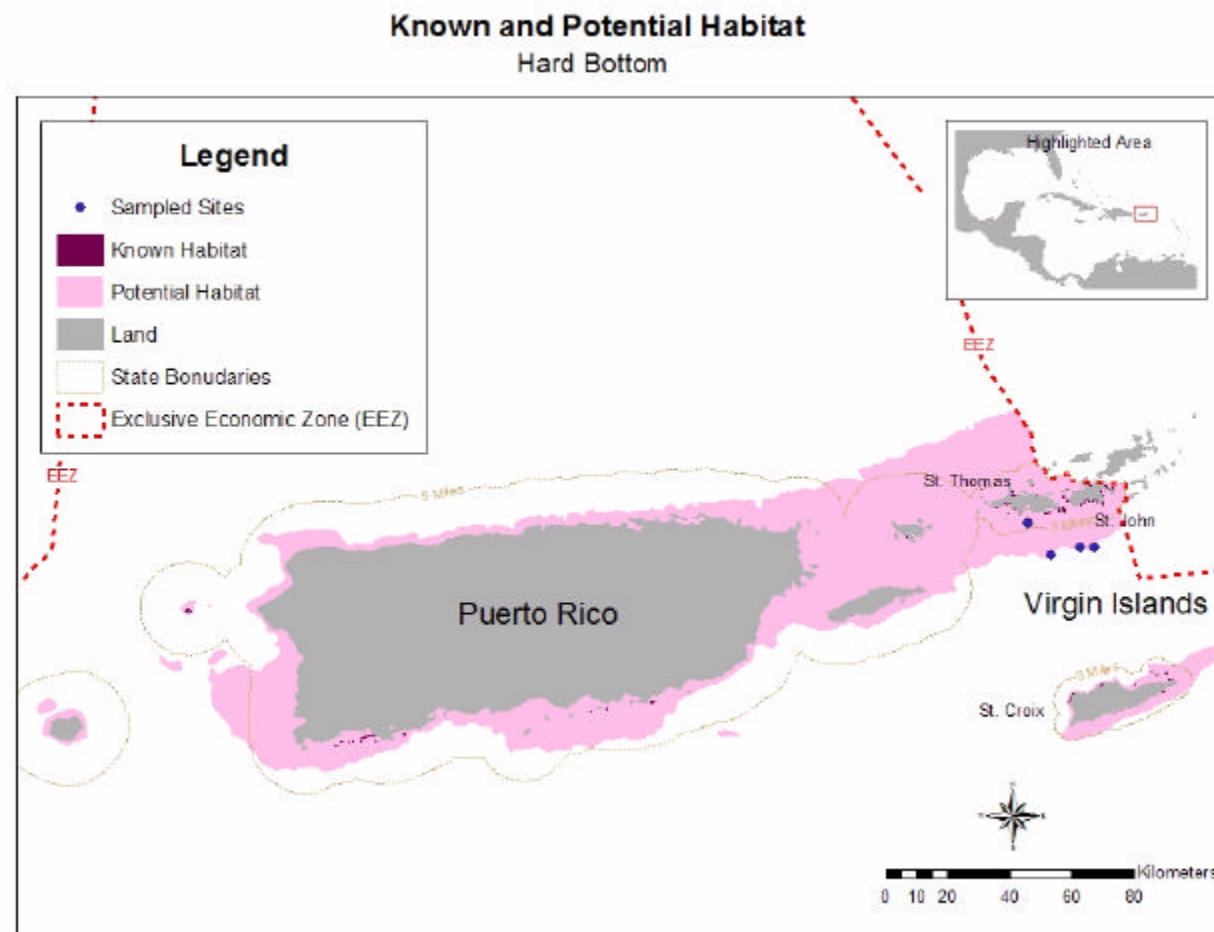


Figure 2.17. Known (from Kendall et al. 2001) and potential hard bottom habitat for Puerto Rico and the US Virgin Islands.

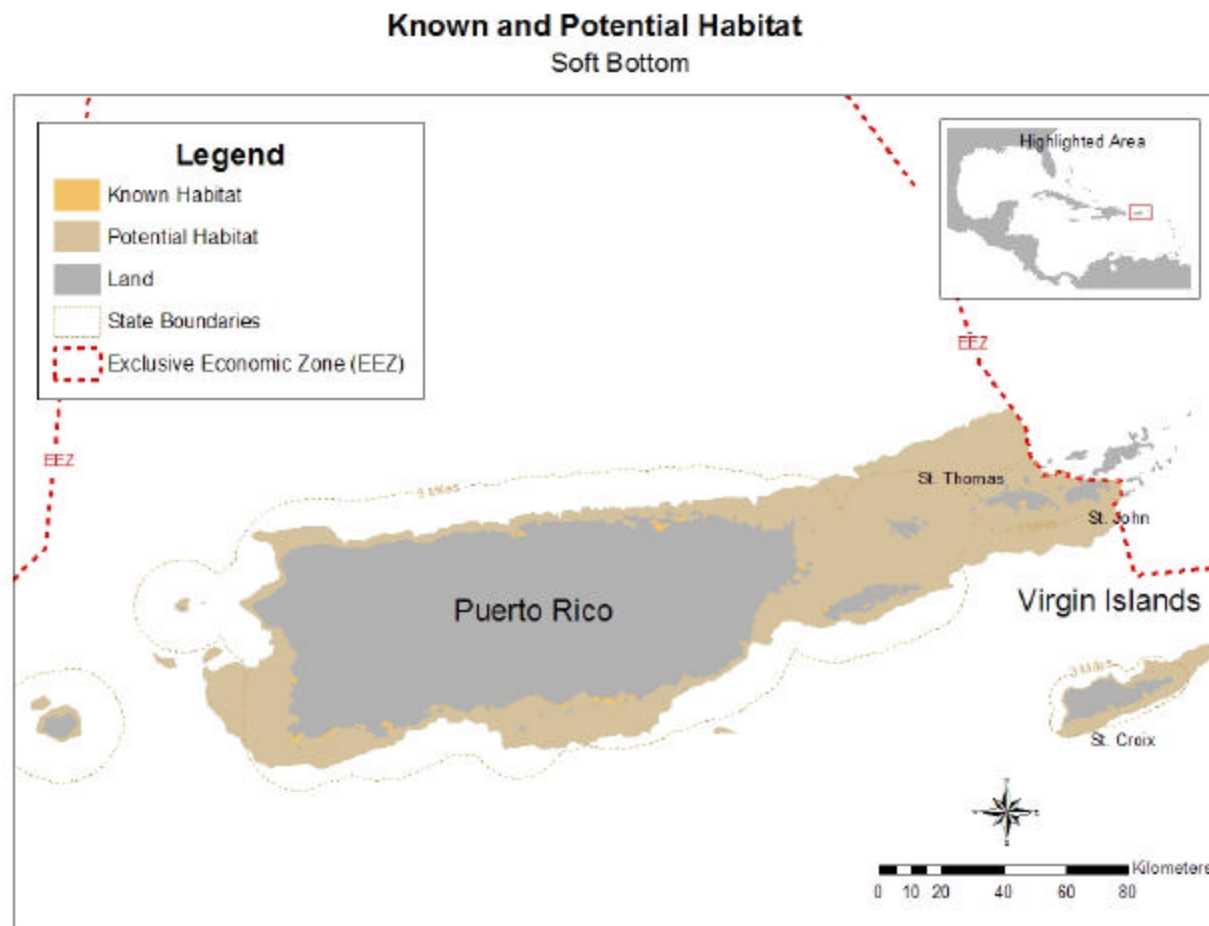


Figure 2.18. Known (from Kendall et al. 2001) and potential soft bottom habitat for Puerto Rico and the US Virgin Islands.

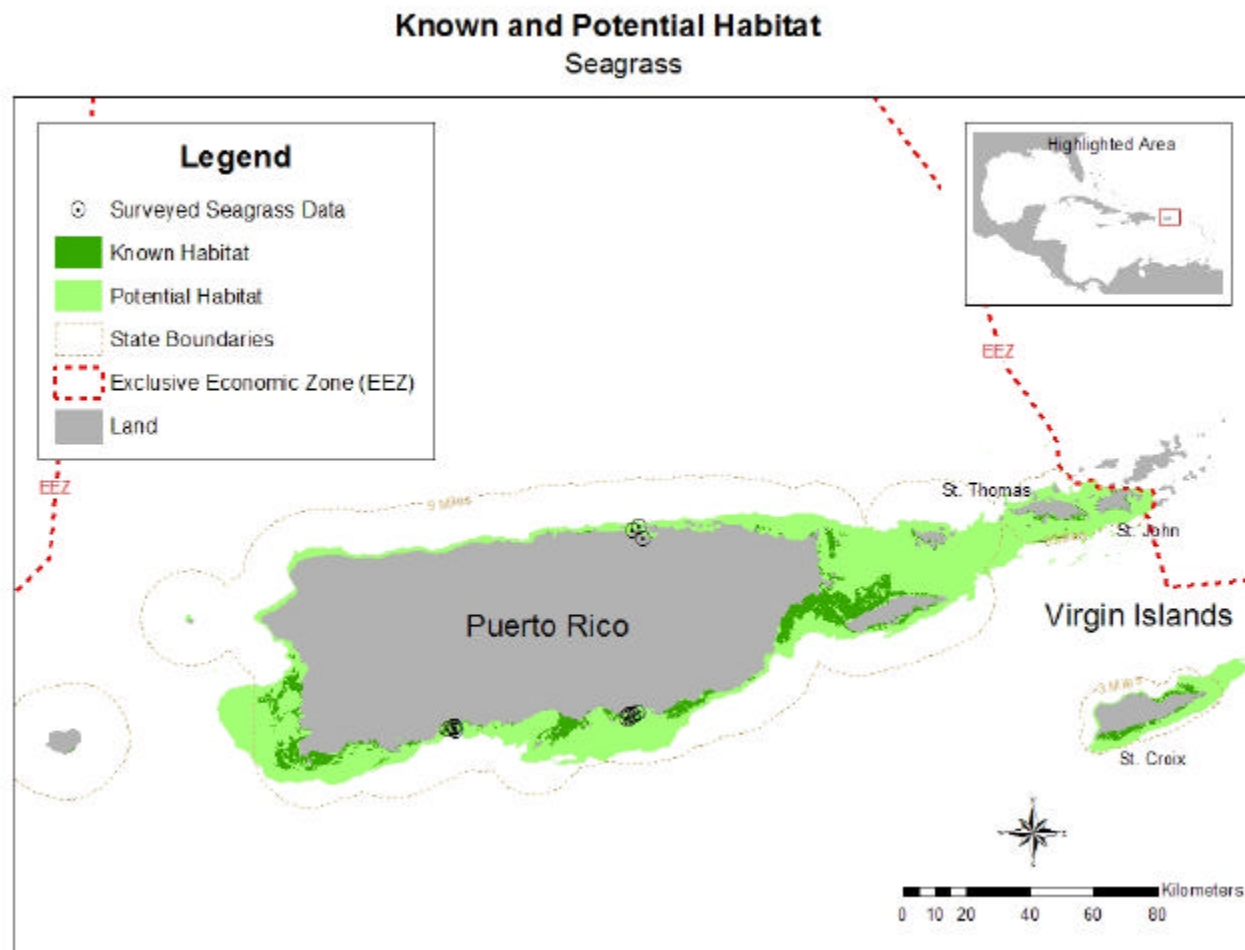


Figure 2.19. Known (from Kendall et al. 2001) and potential seagrass habitat for Puerto Rico and the US Virgin Islands.

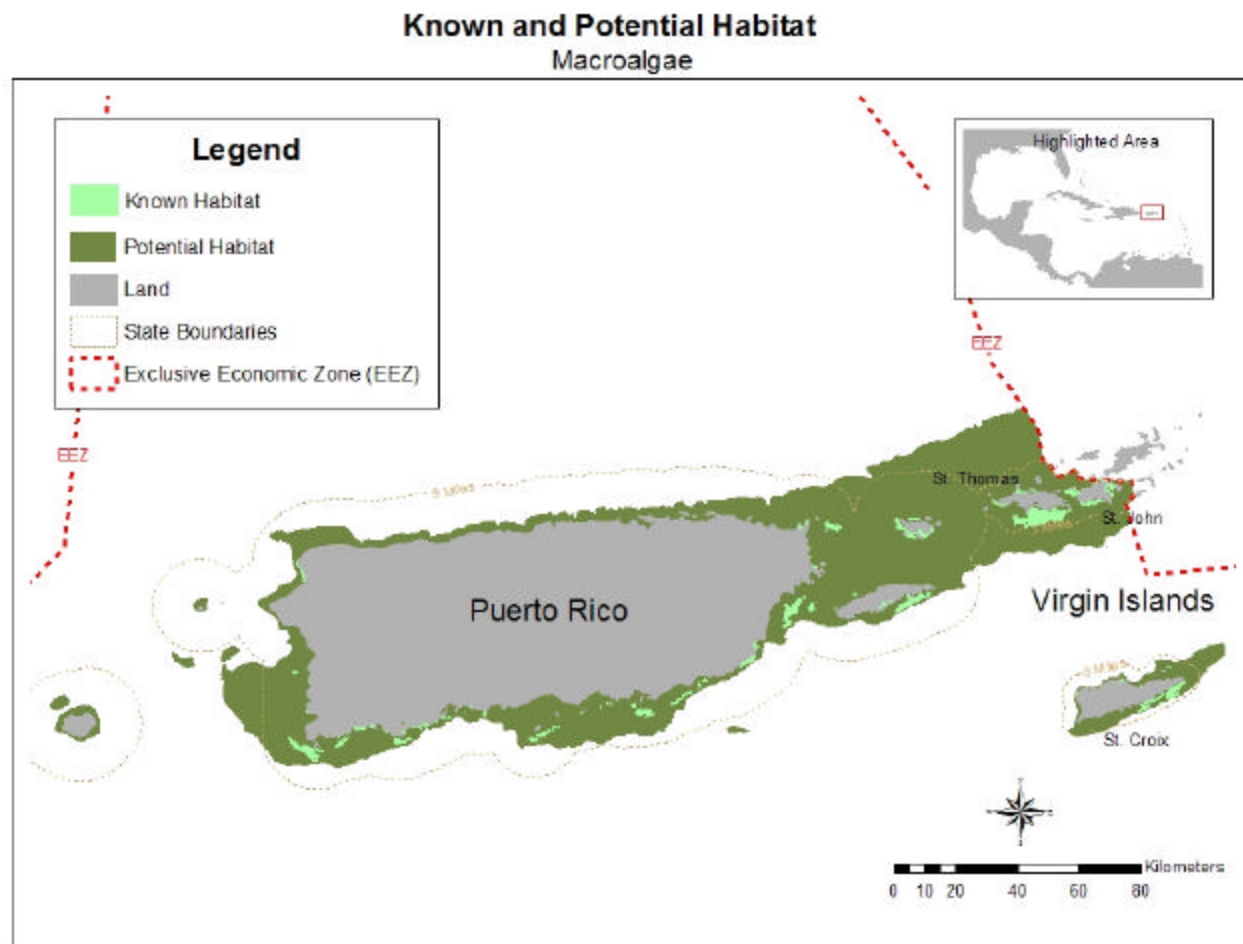


Figure 2.20. Known (from Kendall et al. 2001) and potential benthic algae habitat for Puerto Rico and the US Virgin Islands.

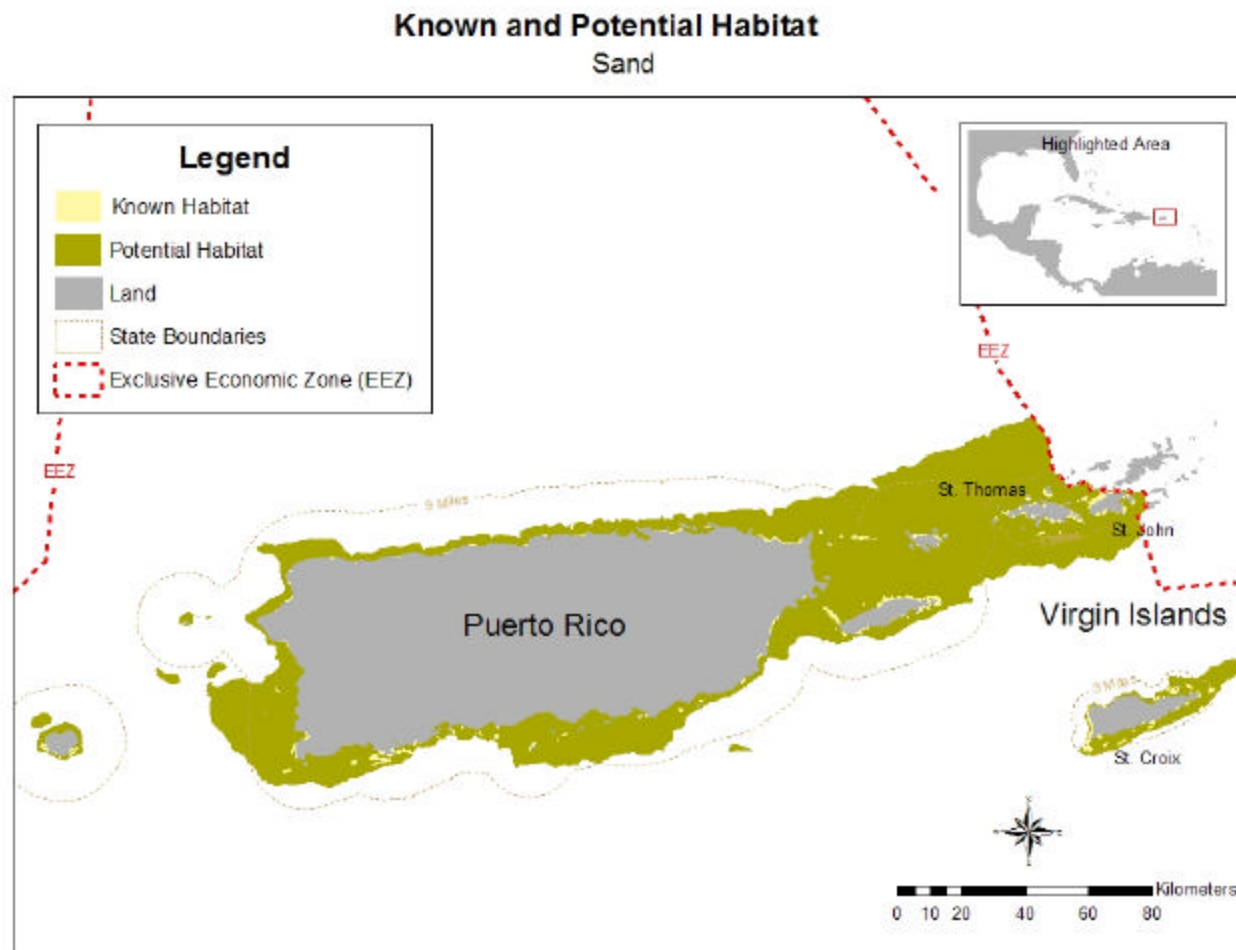


Figure 2.21. Known (from Kendall et al. 2001) and potential sand-shell habitat for Puerto Rico and the US Virgin Islands.

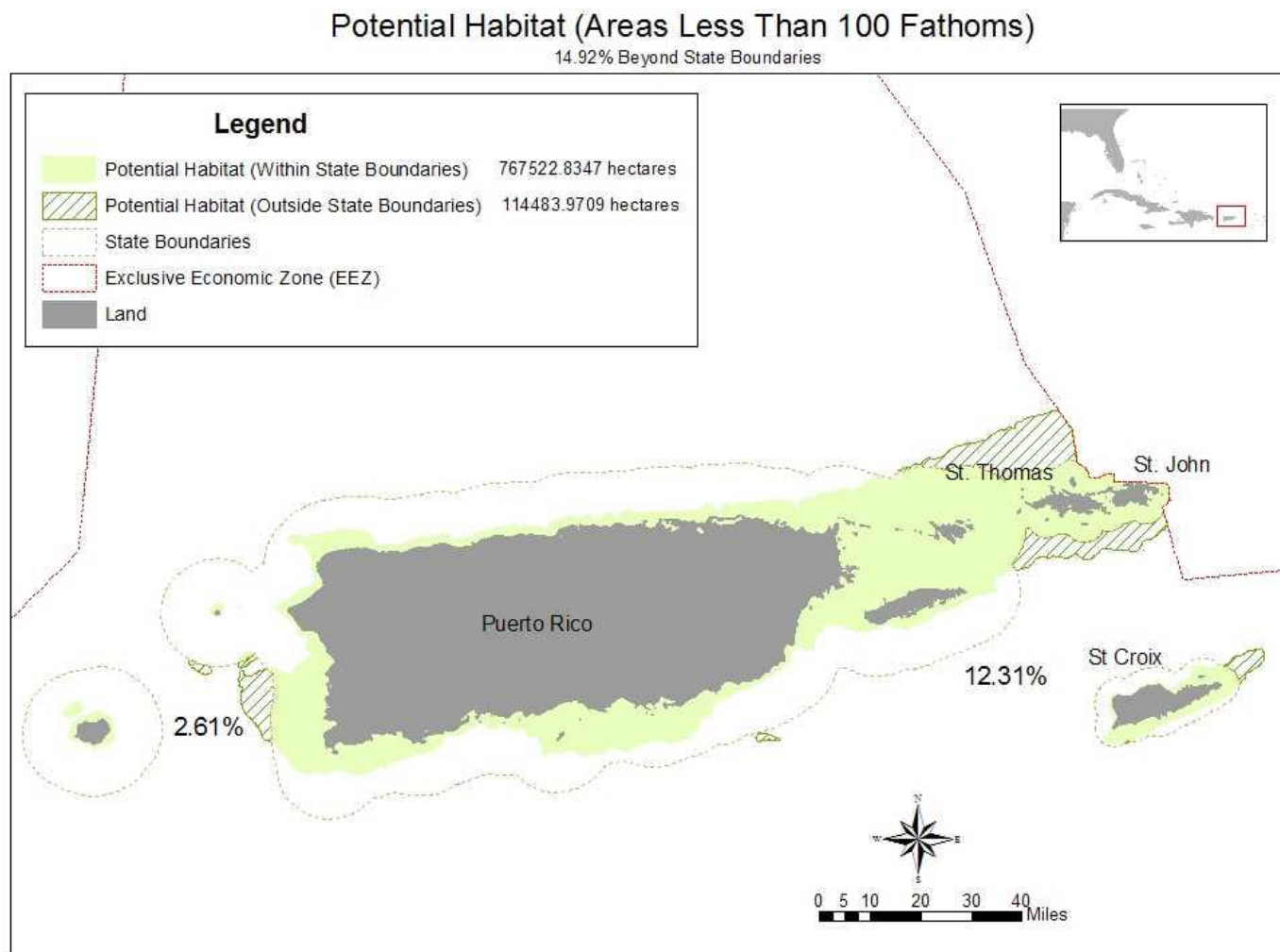


Figure 2.22. Distribution of the US insular shelf in the EEZ and state waters for Puerto Rico and USVI

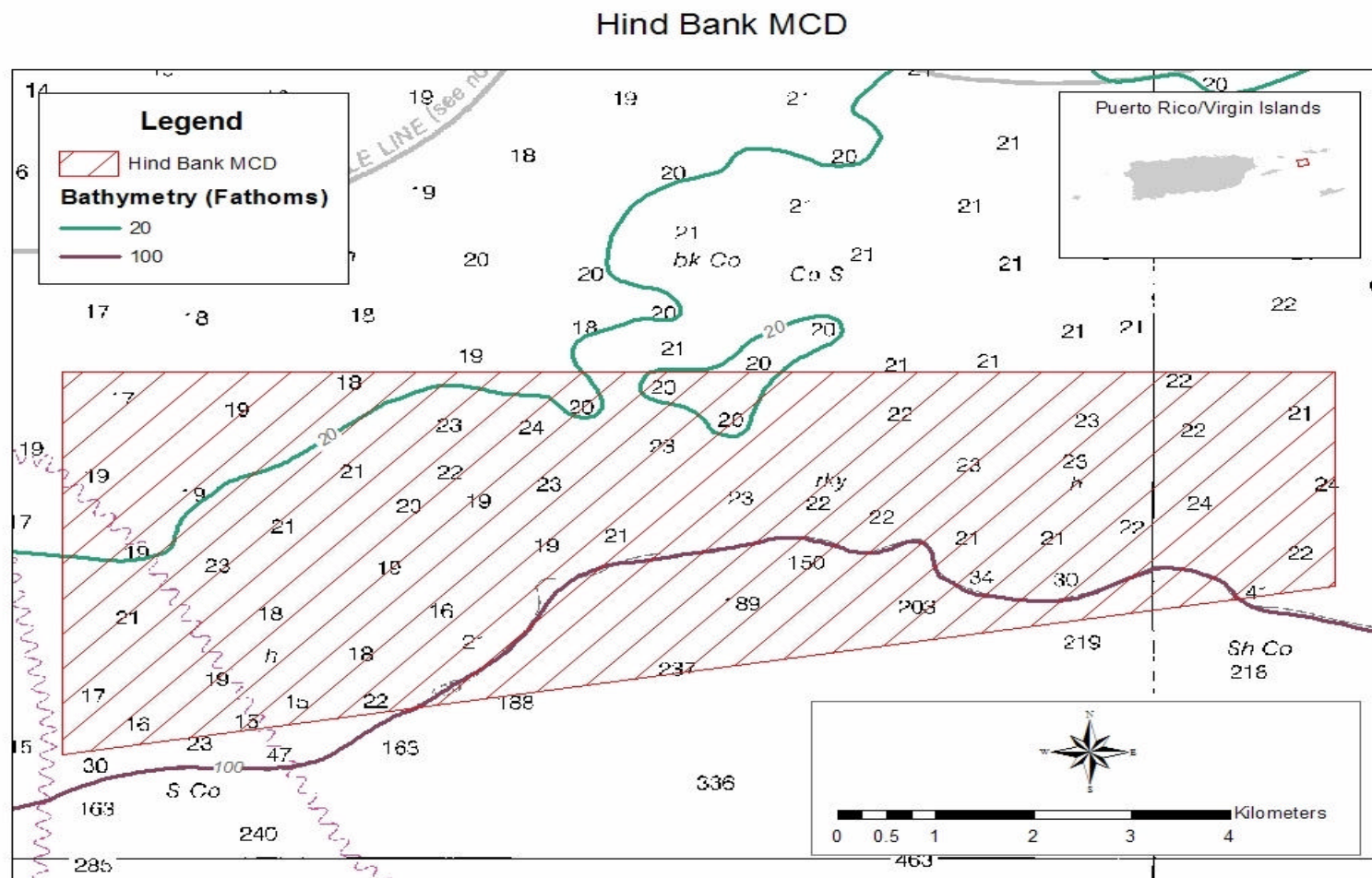


Figure 2.23. Area and bathymetry of the Hind Bank Marine Conservation District.

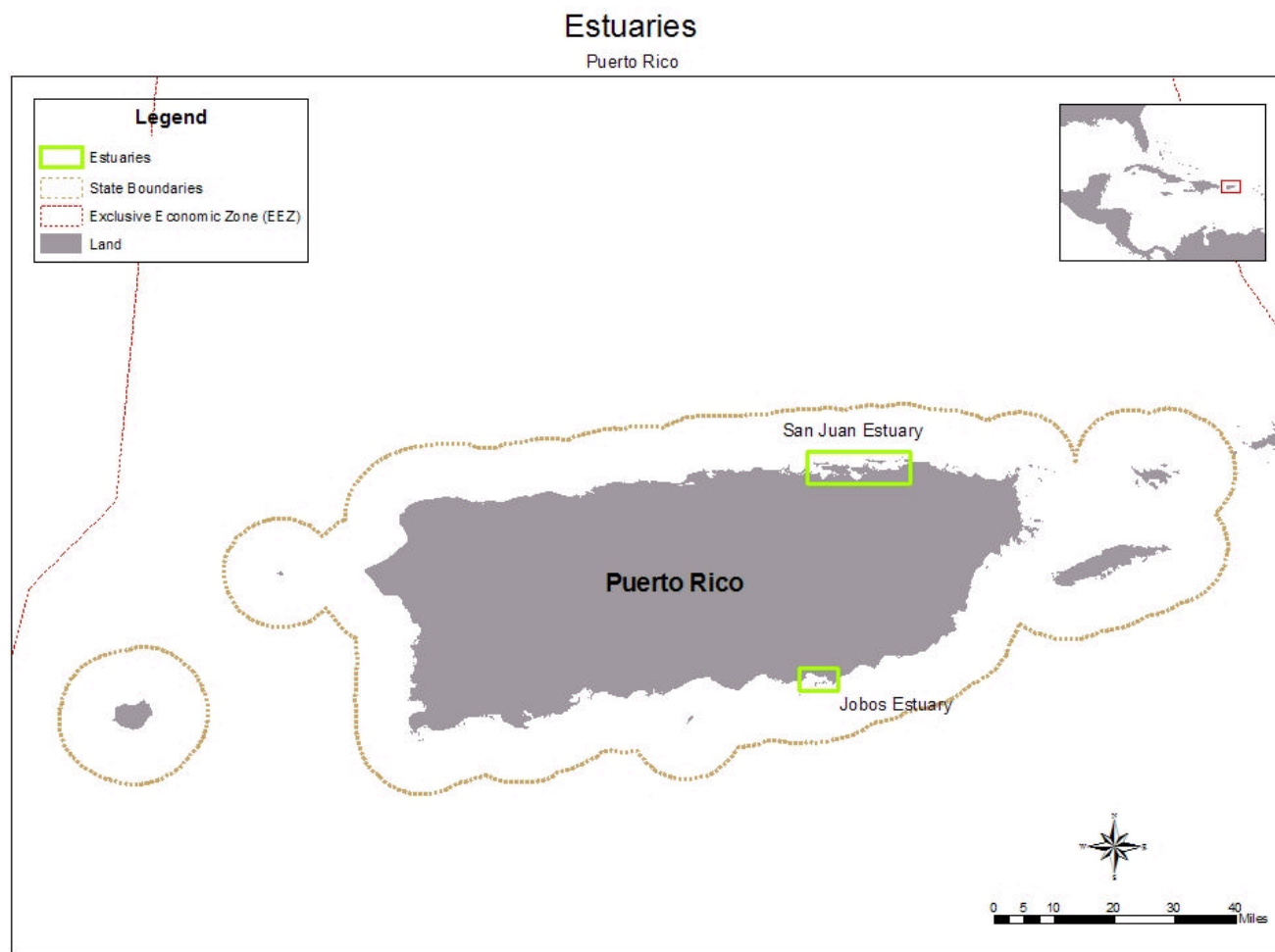


Figure 2.24. Estuaries around Puerto Rico

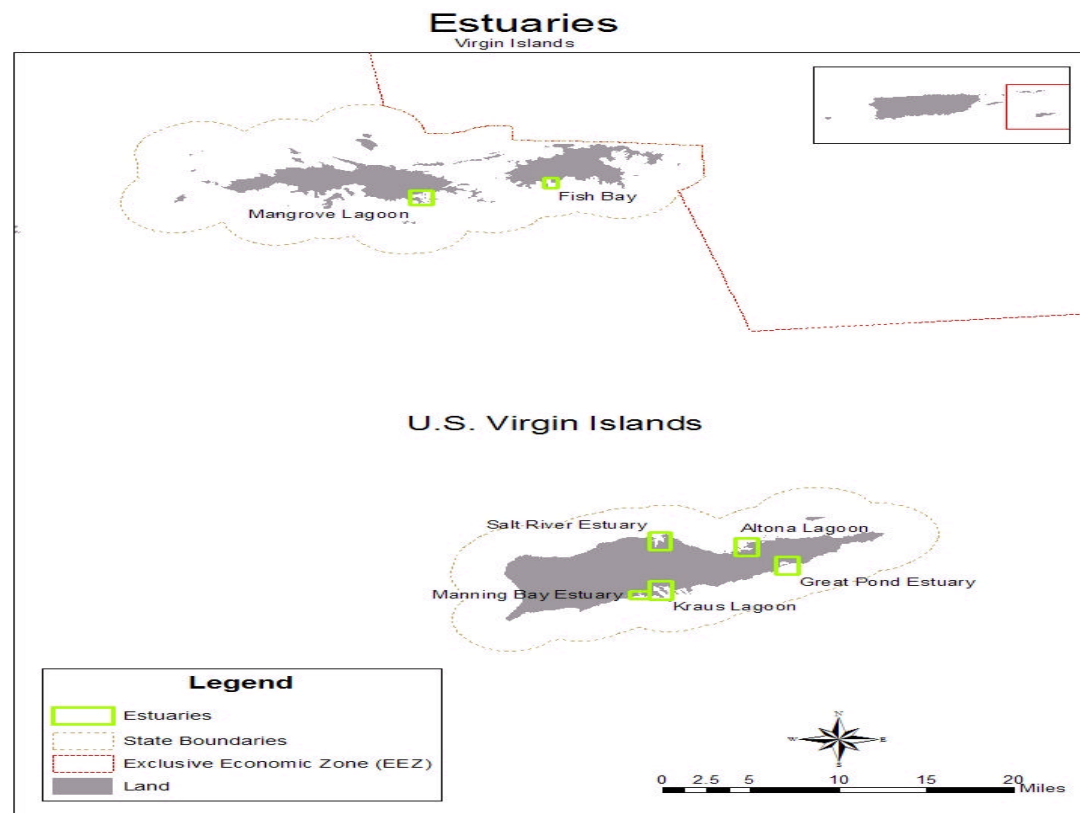


Figure 2.25. Estuaries around the U.S. Virgin Islands

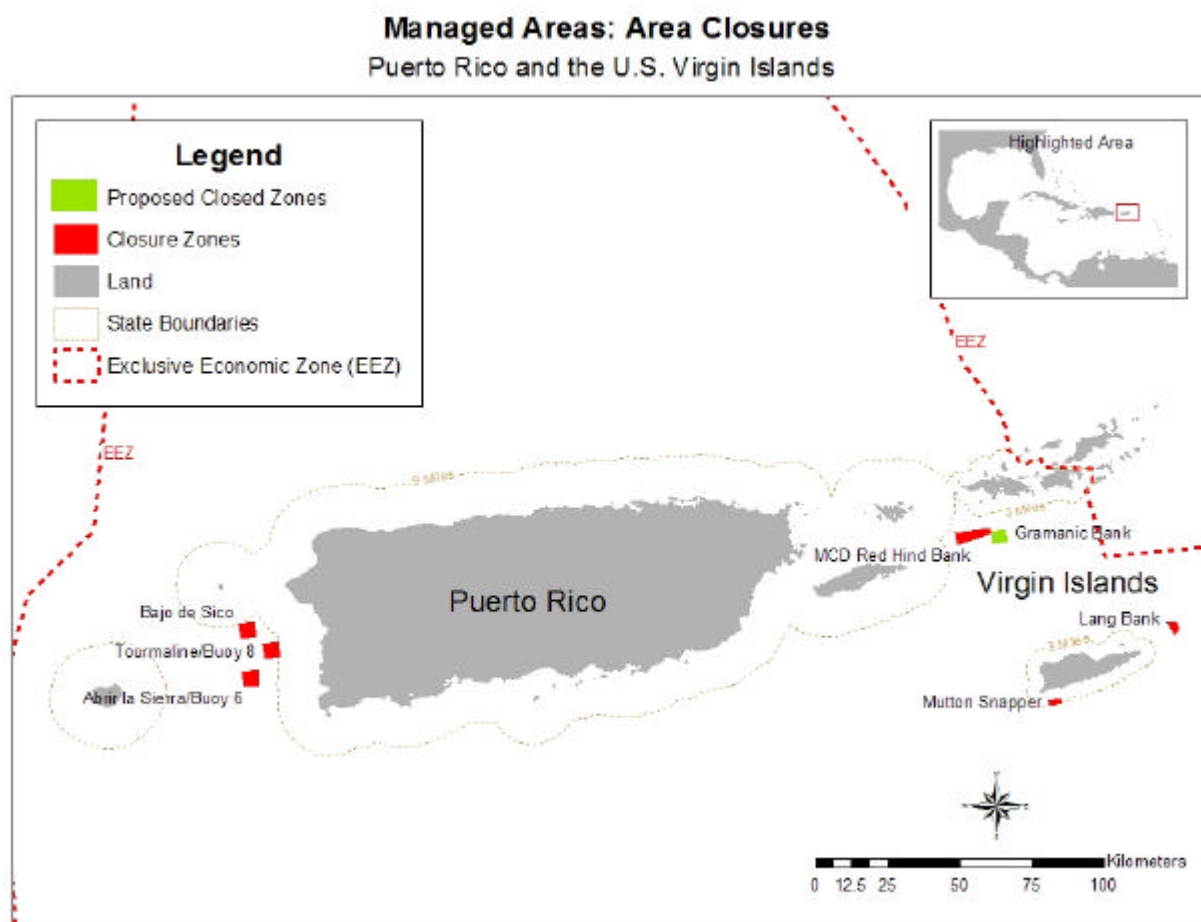


Figure 2.26. Seasonal and permanent spawning ground closures by the Caribbean Fishery Management Council.

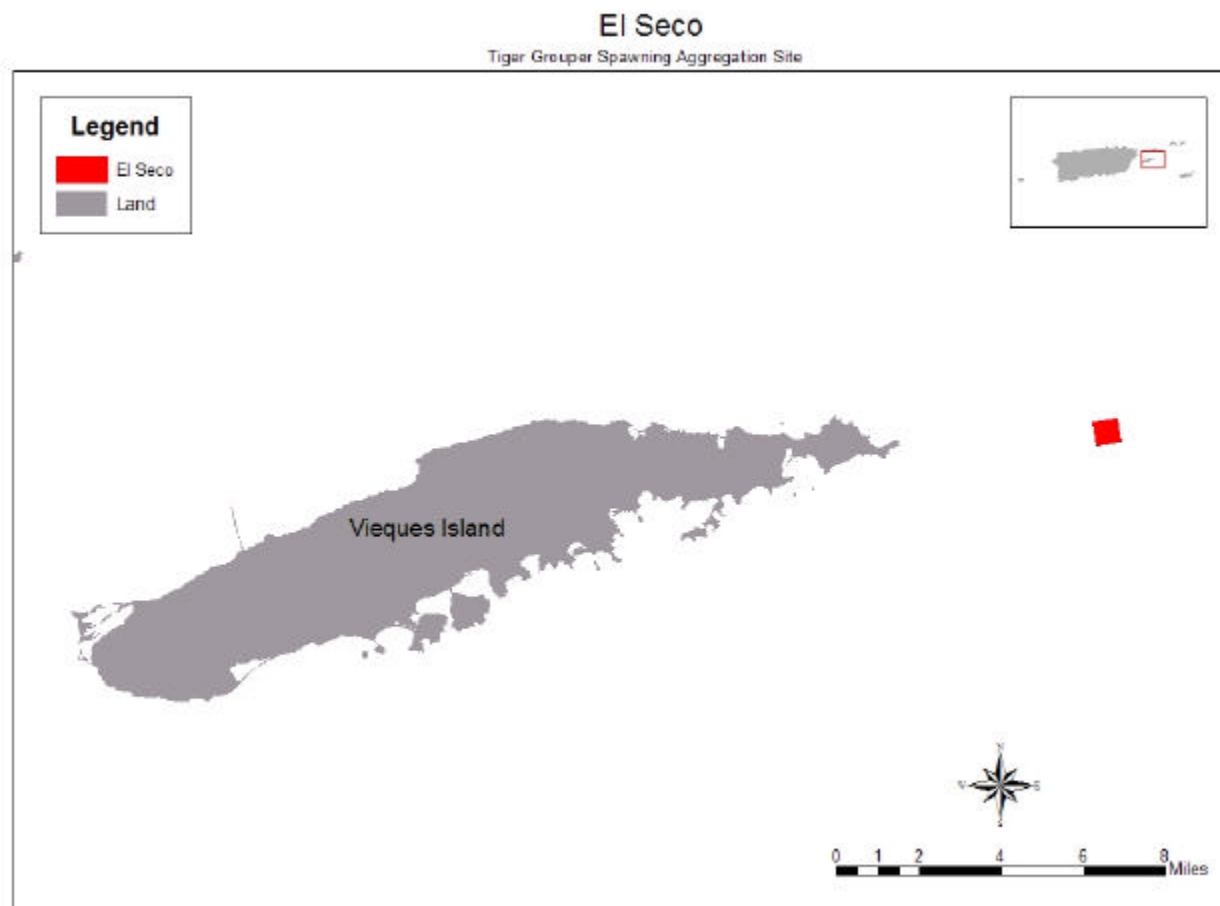


Figure 2.27. Tiger grouper spawning area (El Seco) at Vieques

Potential Red Hind Spawning Aggregation
Puerto Rico: Southwest Coast (February 2002)

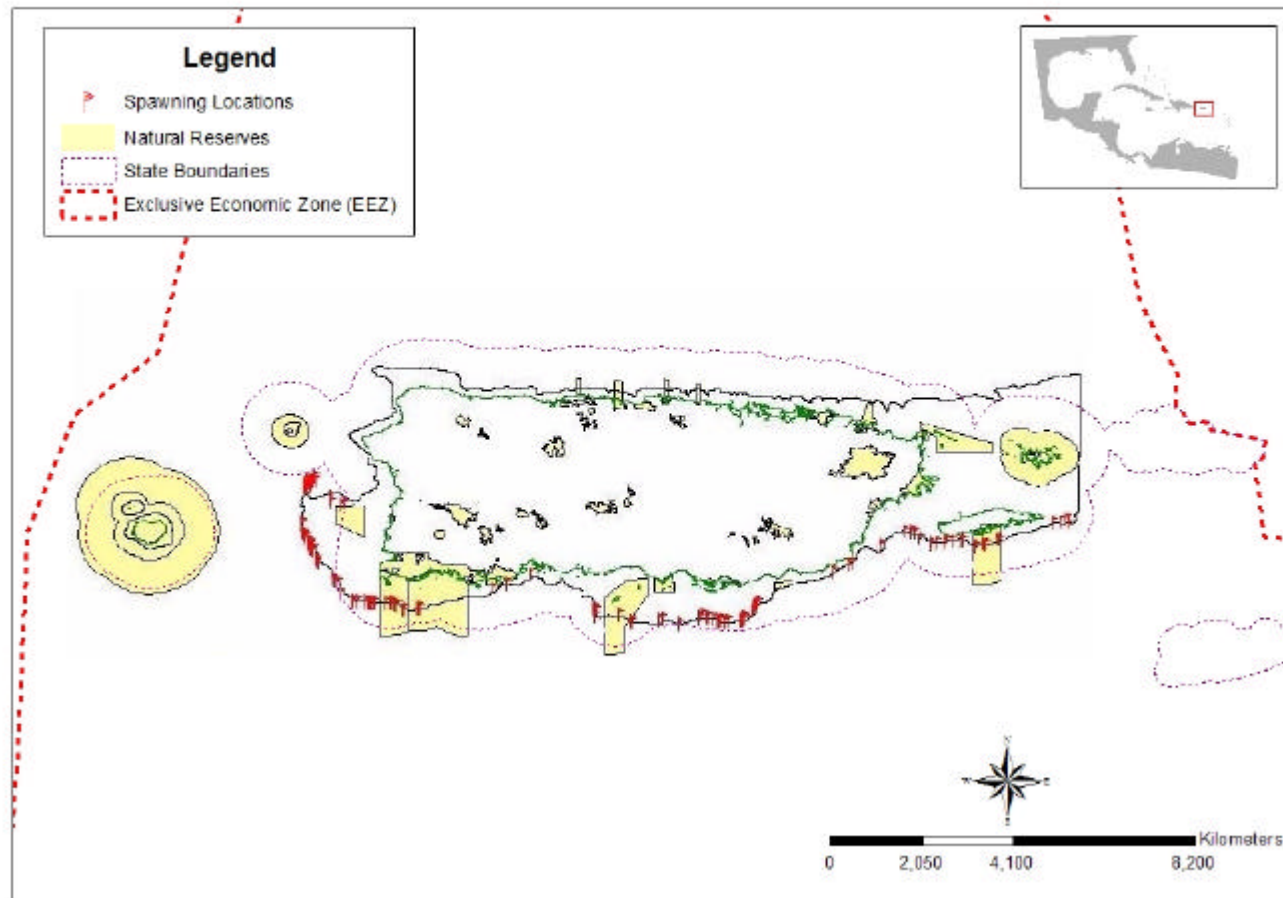


Figure 2.28. Potential new red hind spawning areas from southern Puerto Rico (Jose Rivera, personal communication)

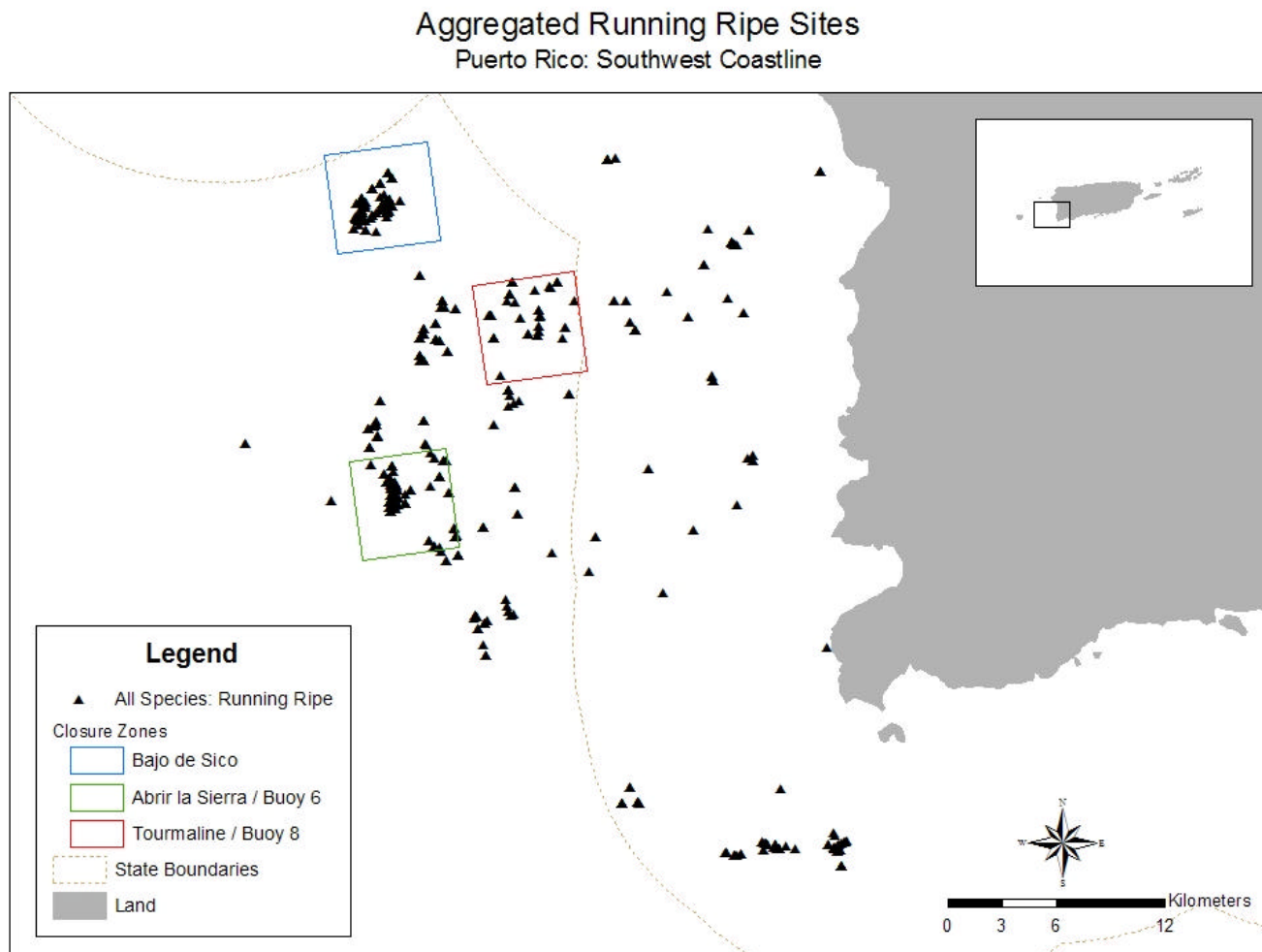


Figure 2.29. Locations of running ripe reef fish from SEAMAP surveys

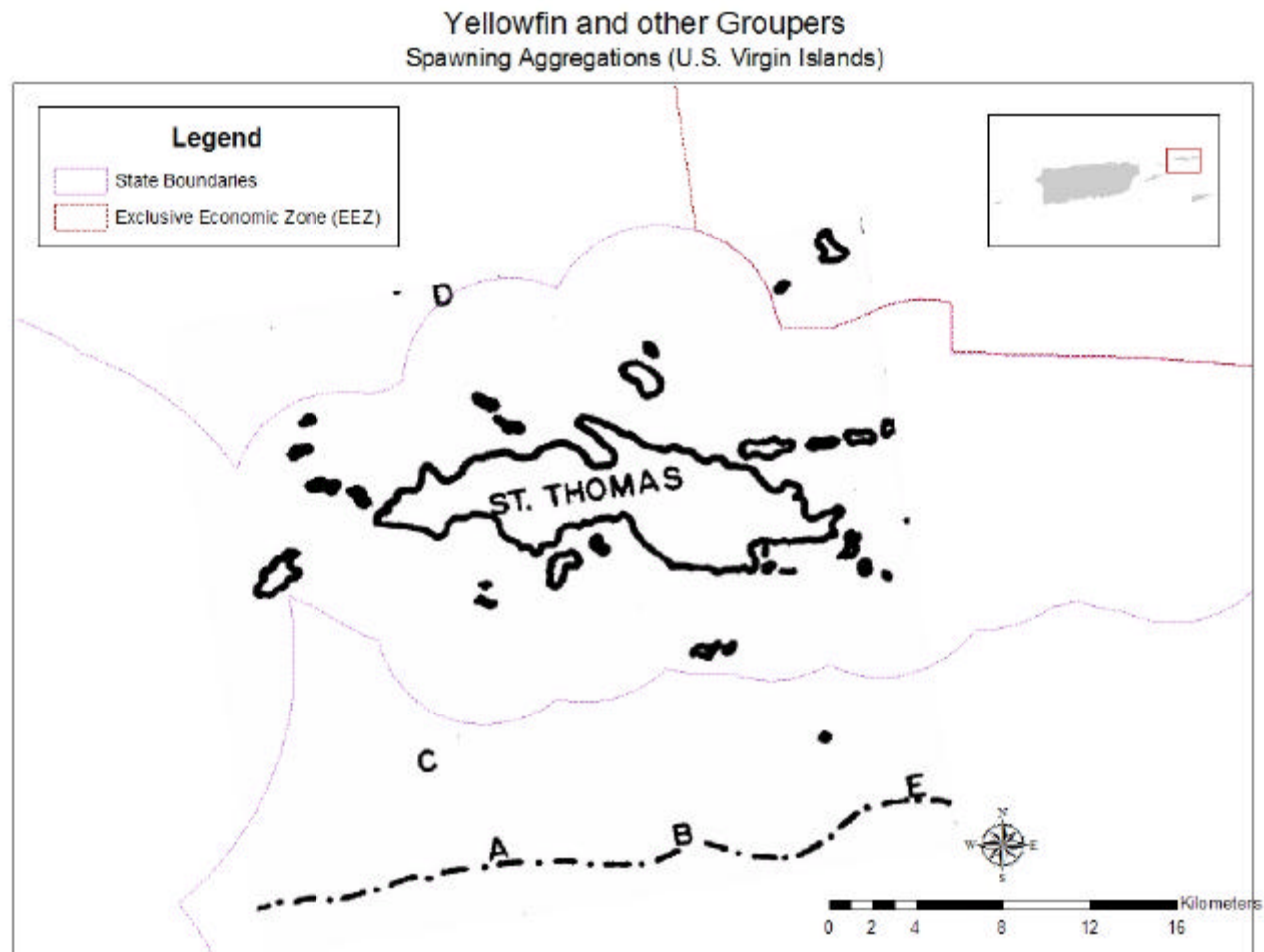


Figure 2.30. Yellowfin grouper spawning areas (Sites A-E) (from Olsen and LaPlace)

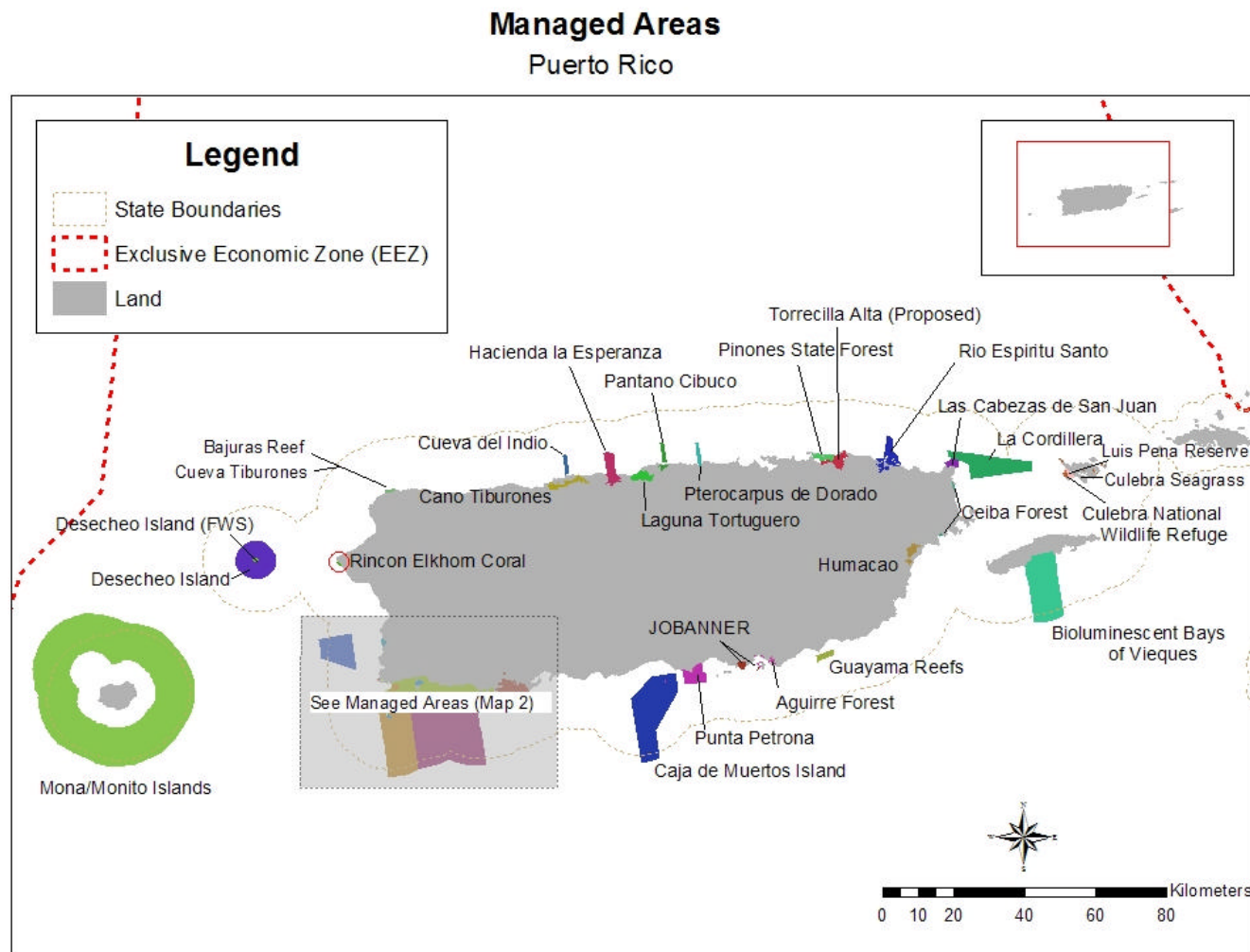


Figure 2.31. Managed areas around Puerto Rico

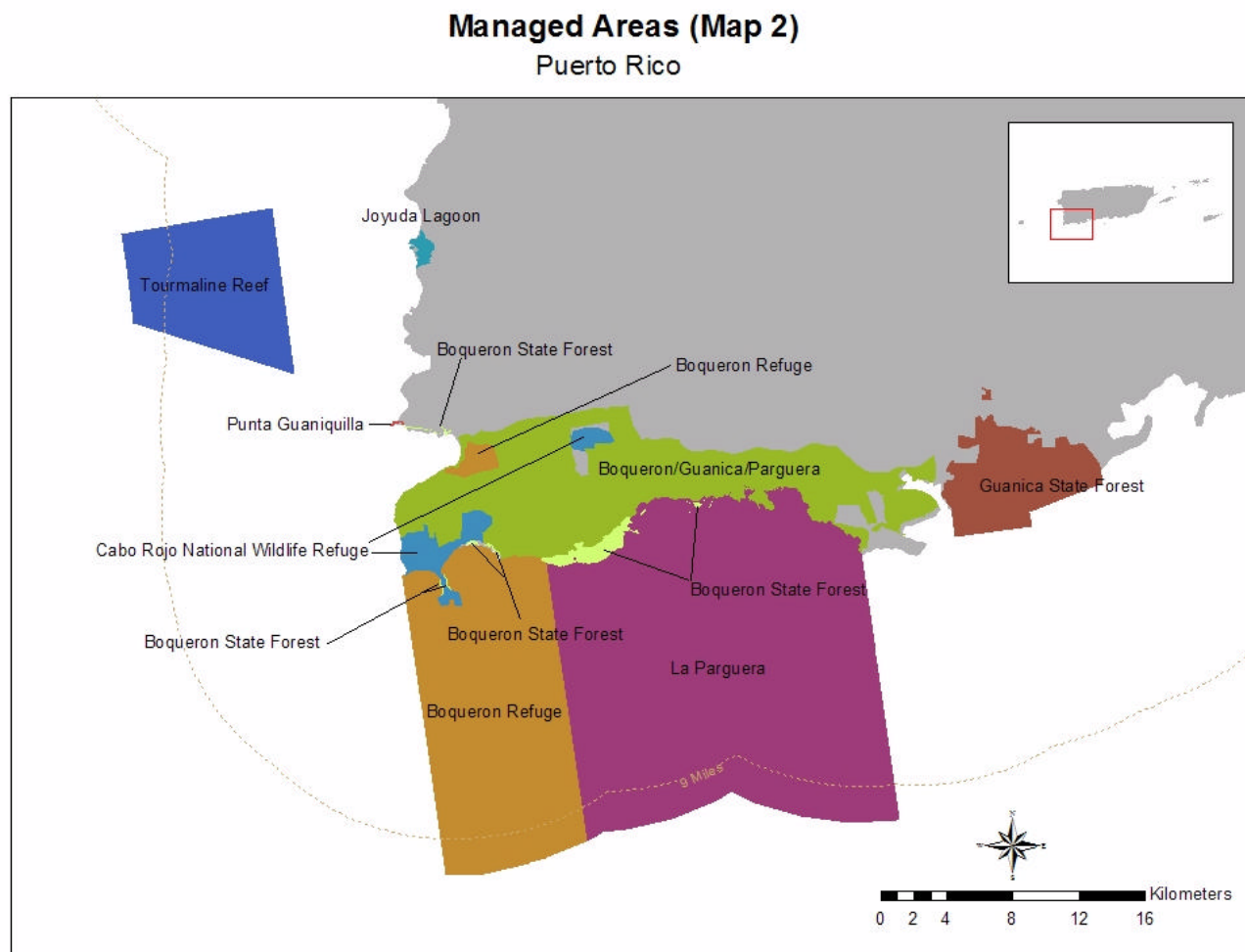


Figure 2.32. Managed areas around southwest Puerto Rico

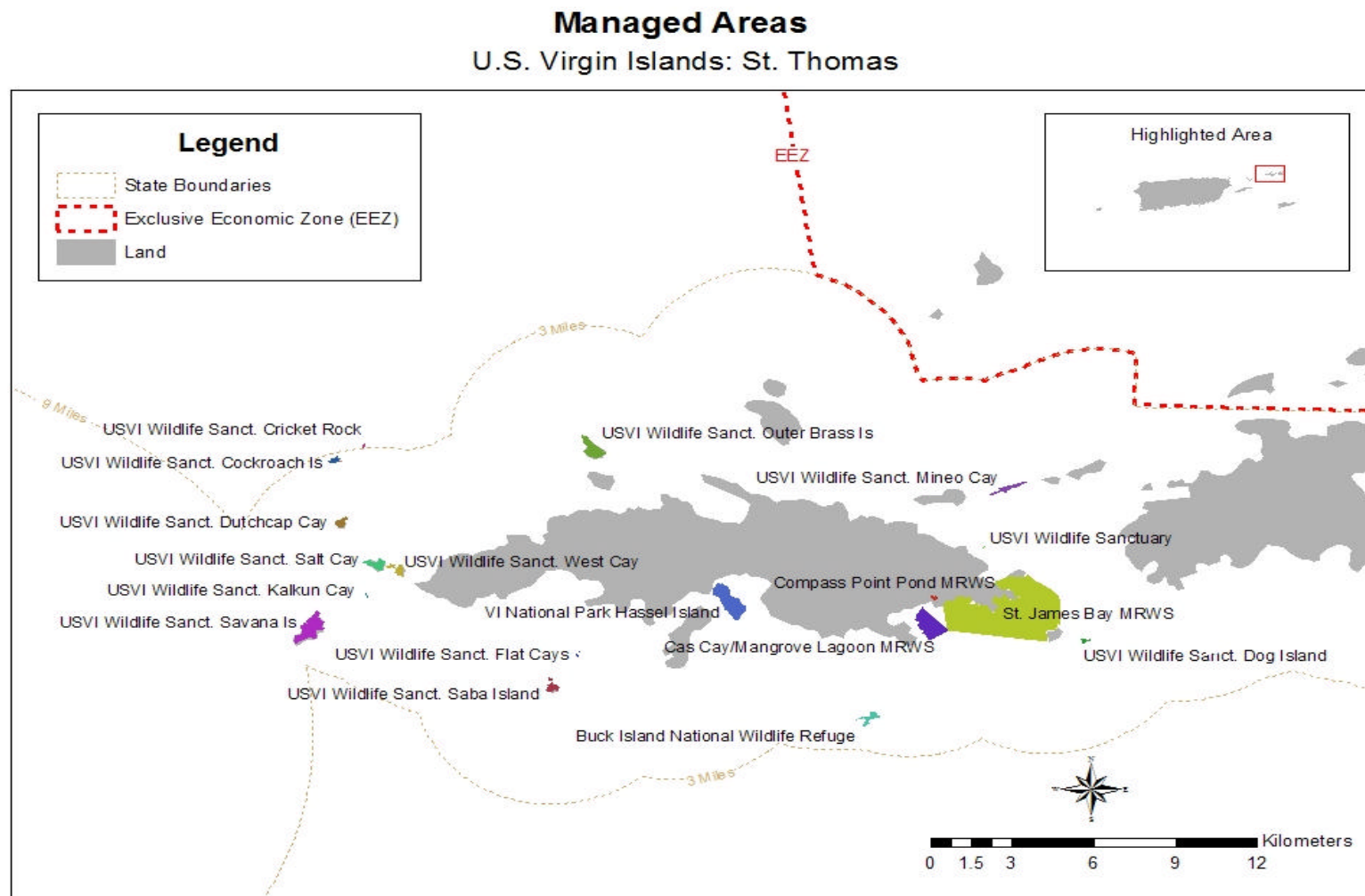


Figure 2.34. Managed areas around St. Thomas

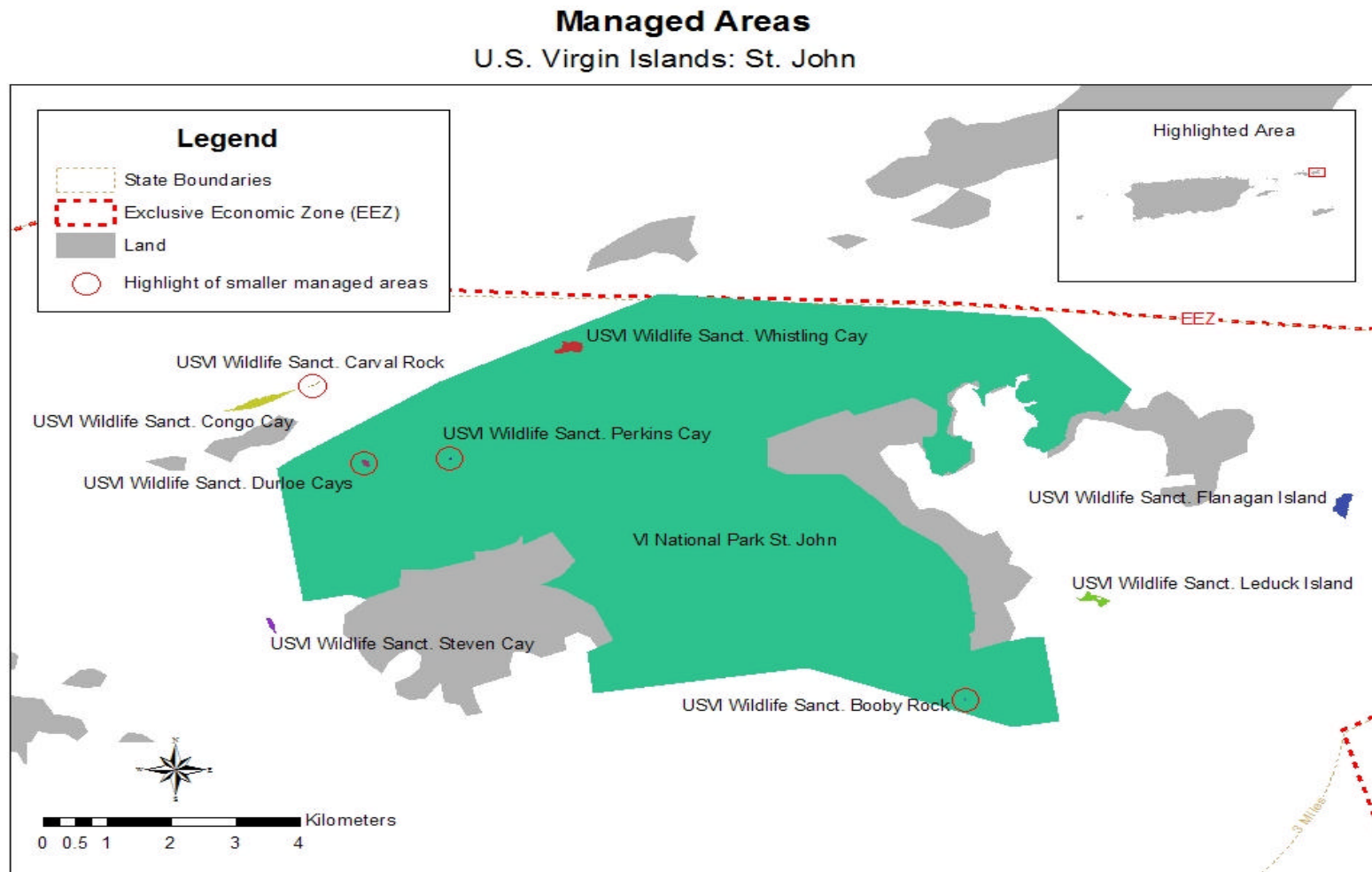


Figure 2.35. Managed areas around St. John

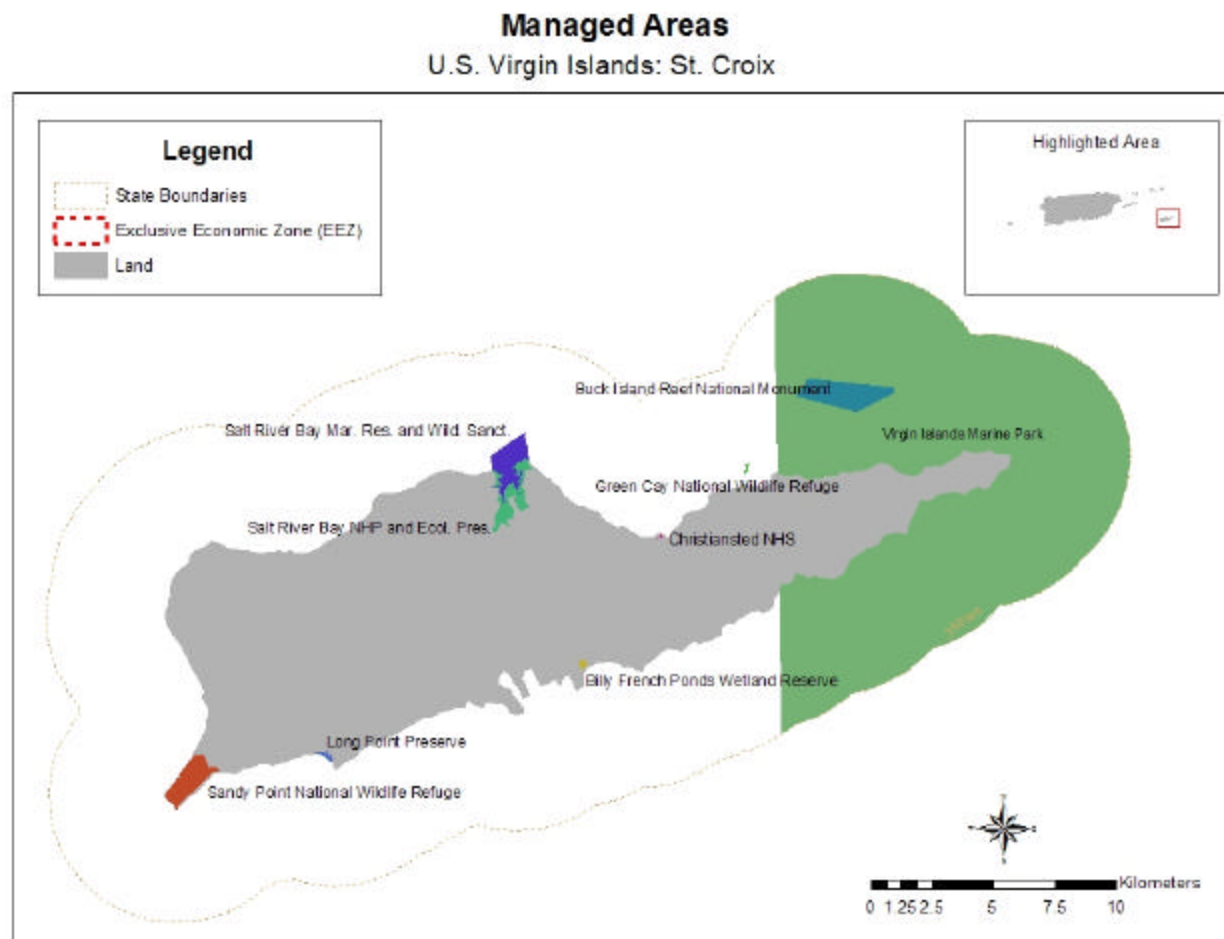


Figure 2.36. Managed areas around St. Croix

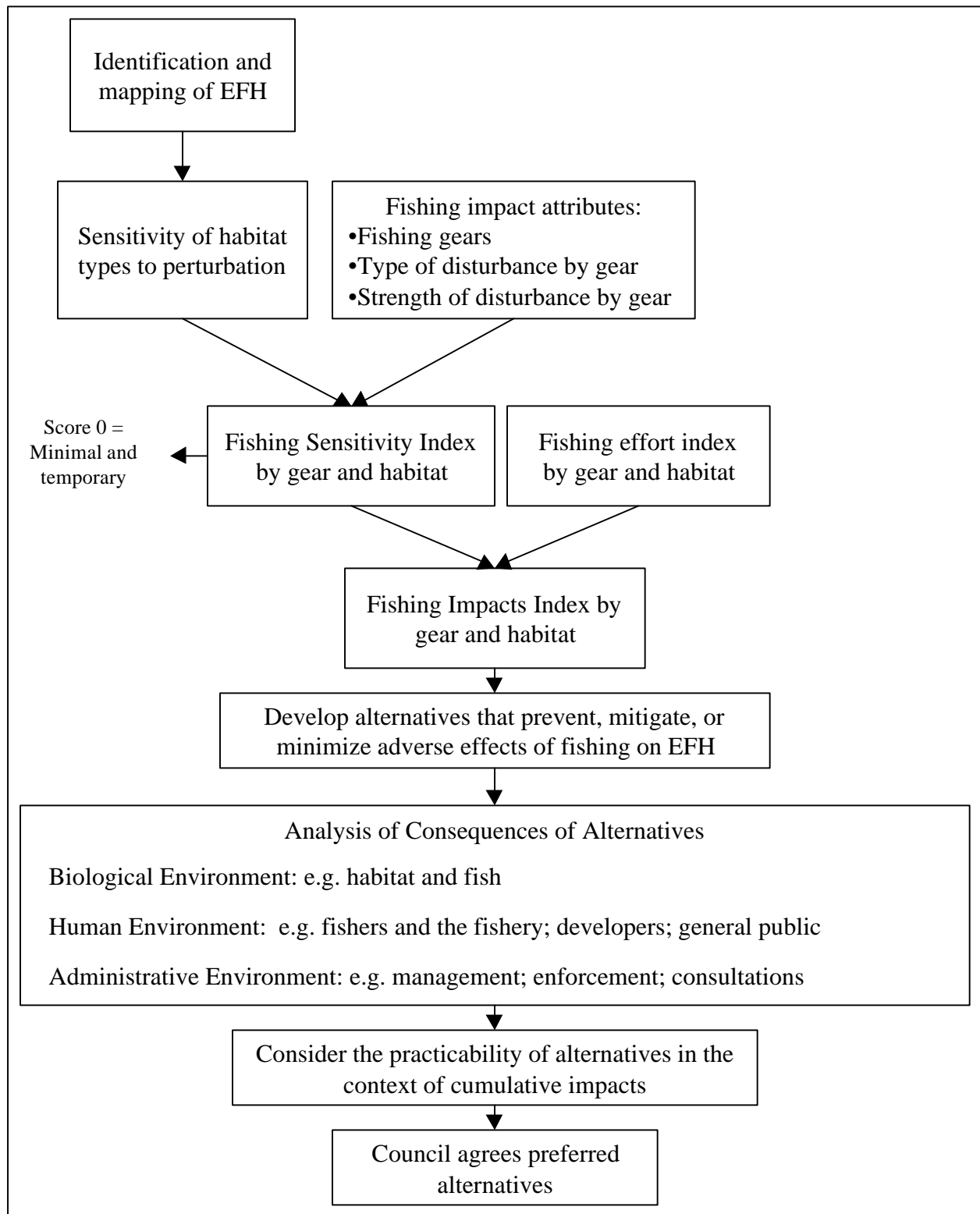


Figure 2.37. Flow diagram to demonstrate the formulation and analysis of alternatives for preventing, mitigating, or minimizing the adverse effects of fishing.

EFH in the US Caribbean

Puerto Rico and the U.S. Virgin Islands

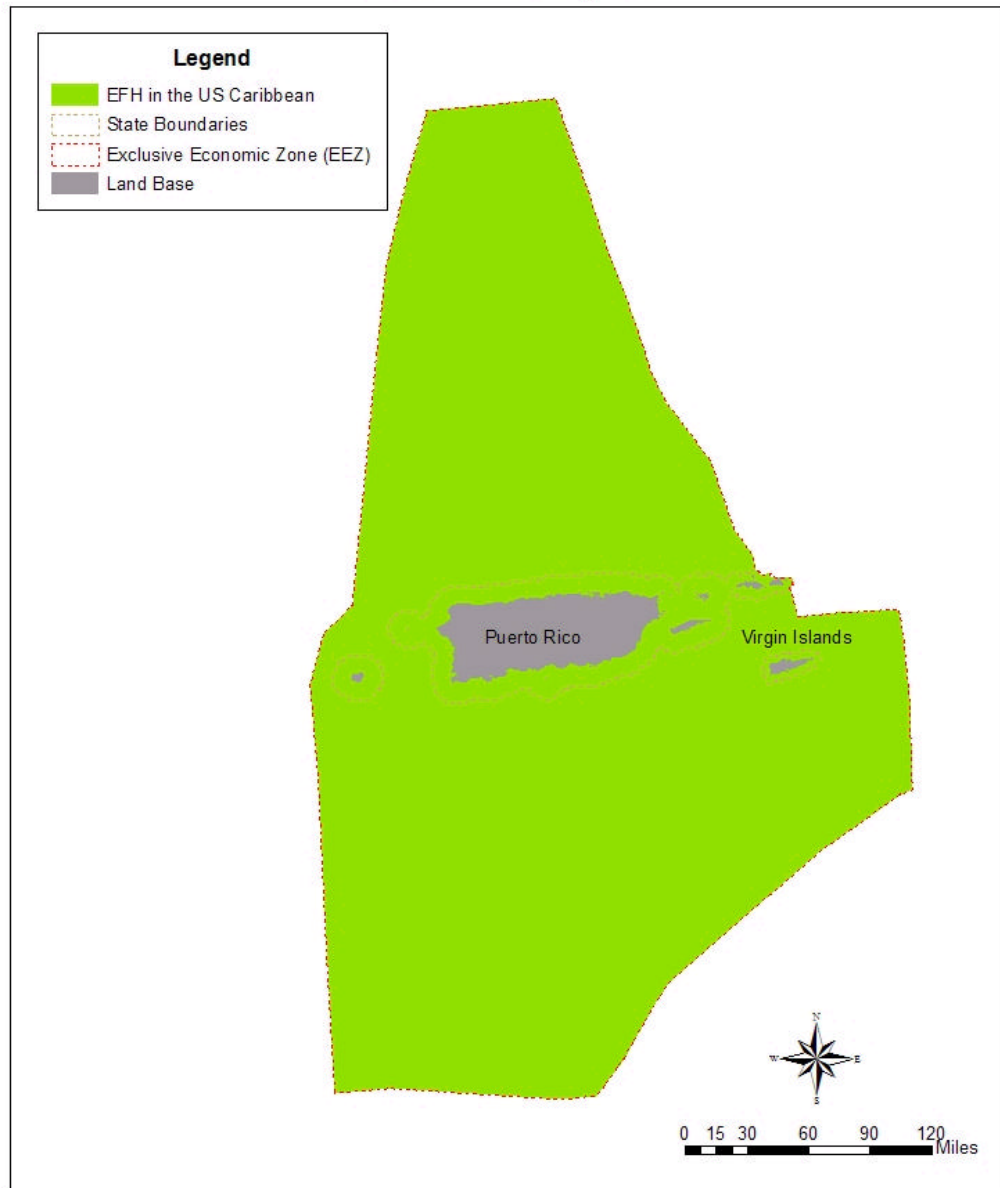


Figure 2.38. Composite EFH for species and life stages of the Spiny Lobster, Queen Conch, Reef Fish, and Coral FMPs under alternatives of Concept 2 and 6.

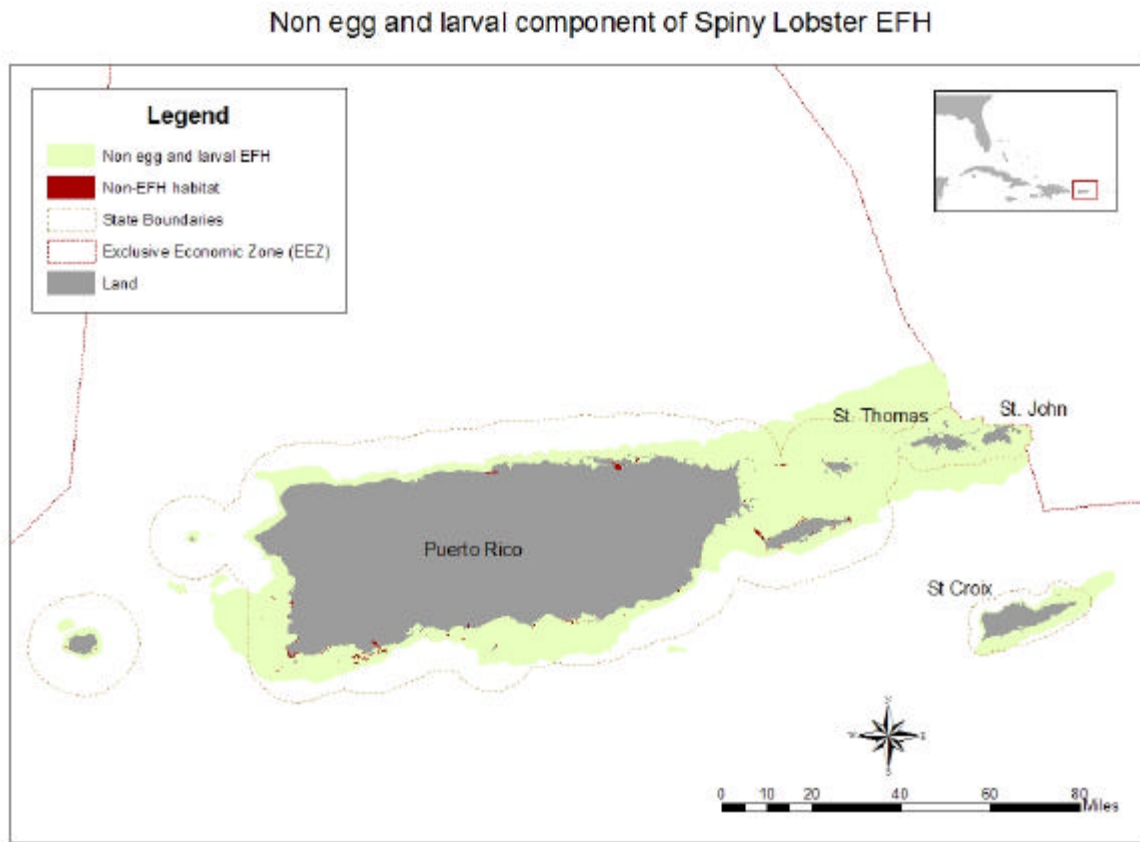


Figure 2.39. EFH designation for Spiny Lobster under Spiny Lobster Alternative 6.

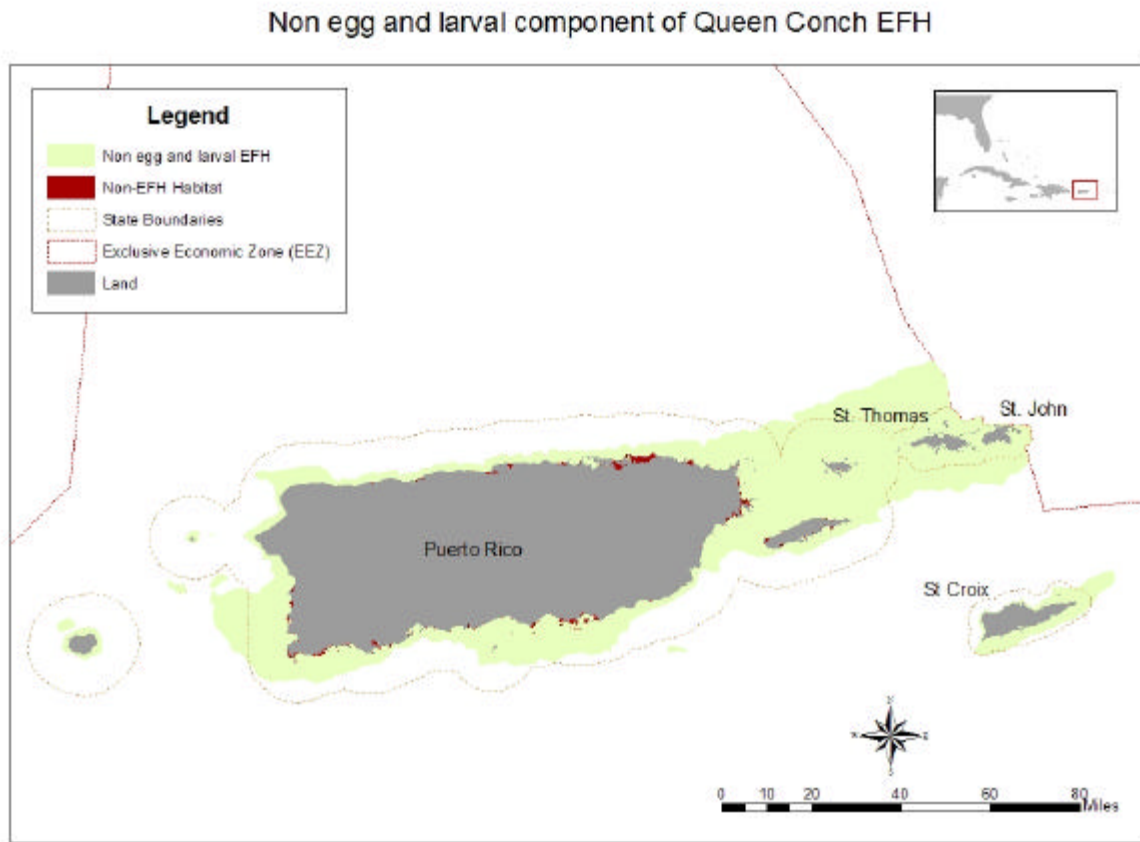


Figure 2.40. EFH designation for Queen Conch under the Queen Conch Alternative 6.

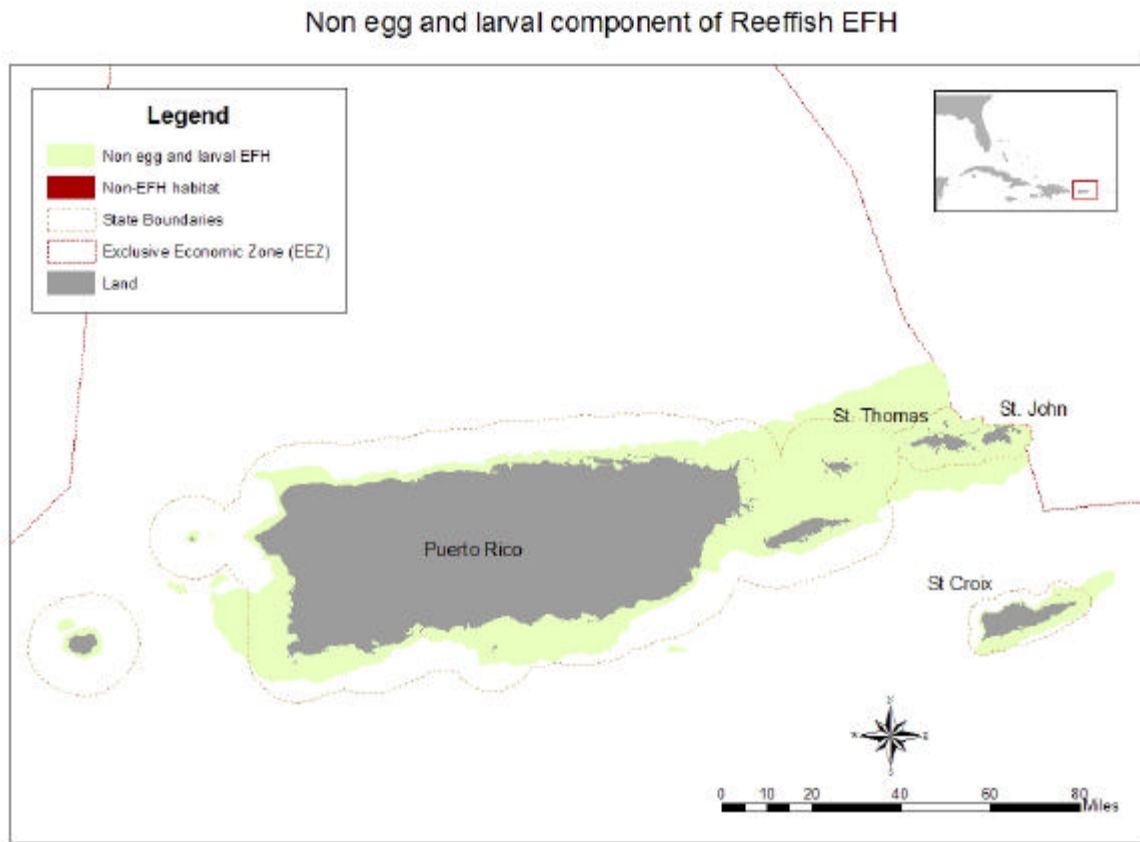


Figure 2.41. EFH designation for Reef Fish under Reef Fish Alternative 6.

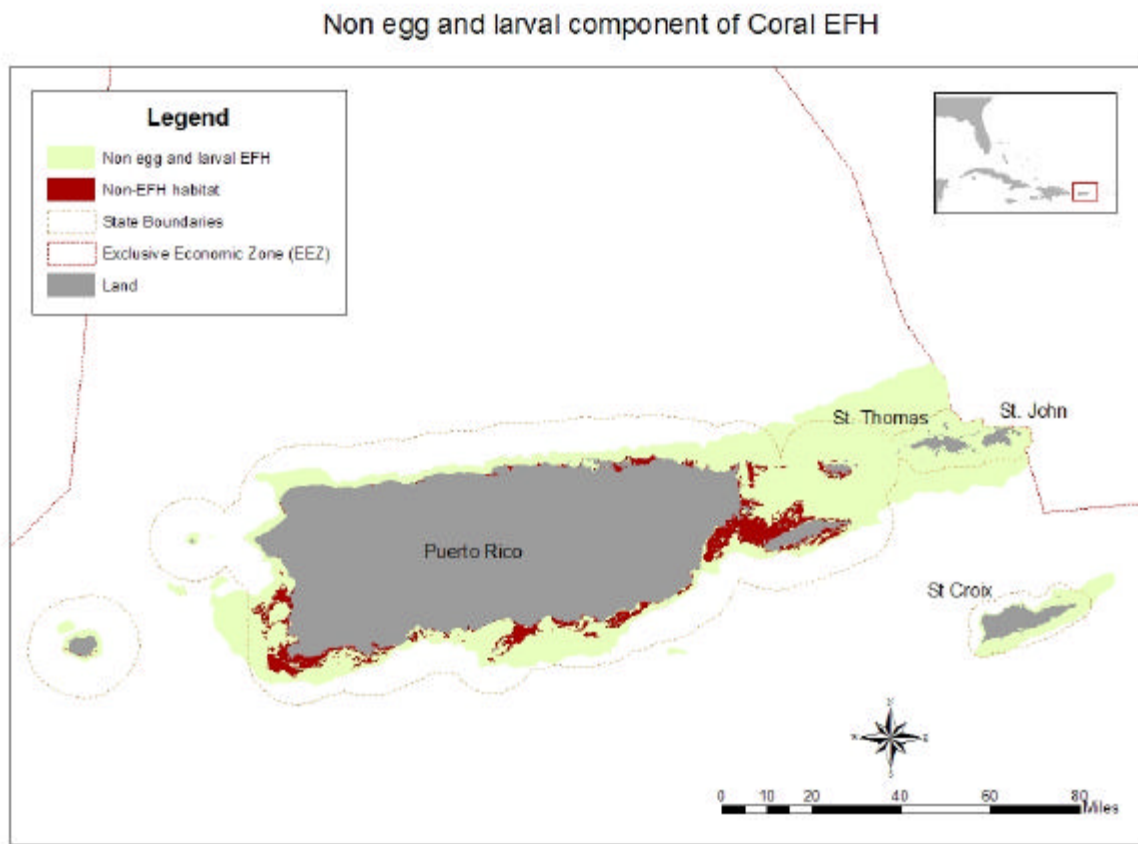


Figure 2.42. EFH designation for Coral under Coral Alternative 6.

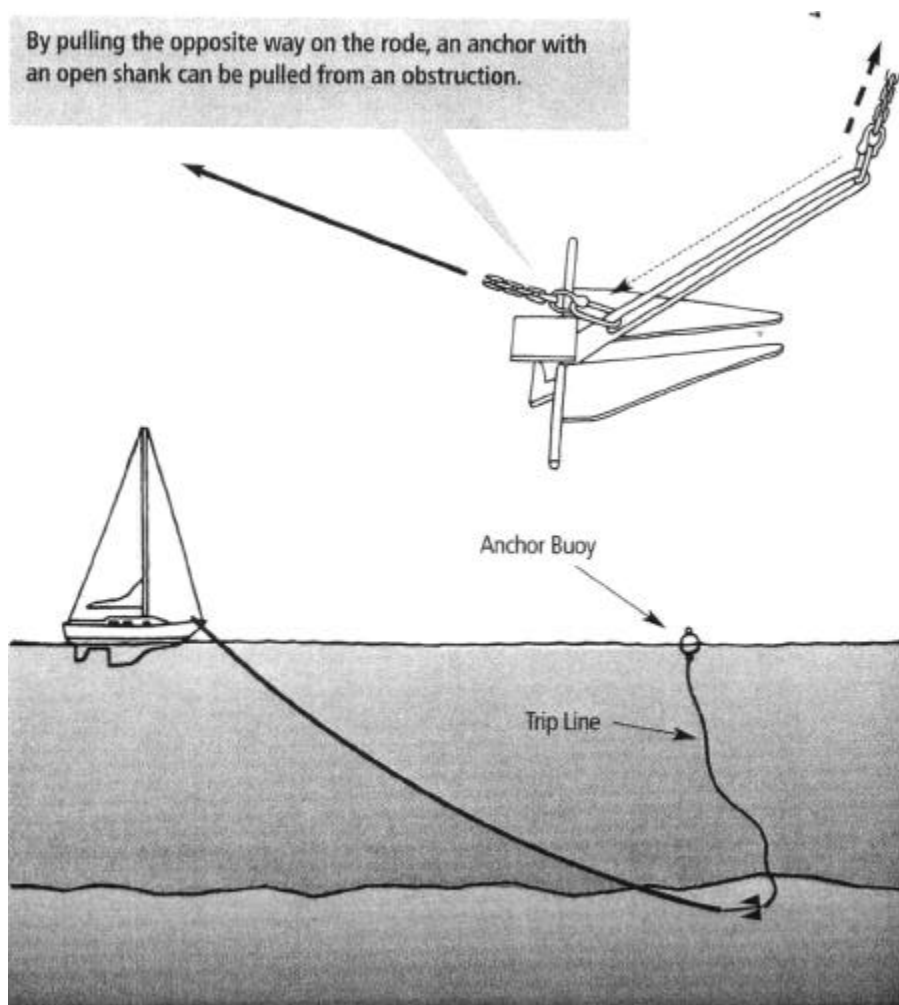


Figure 2.43. Trip line anchor retrieval system (from Rousmaniere 1999)

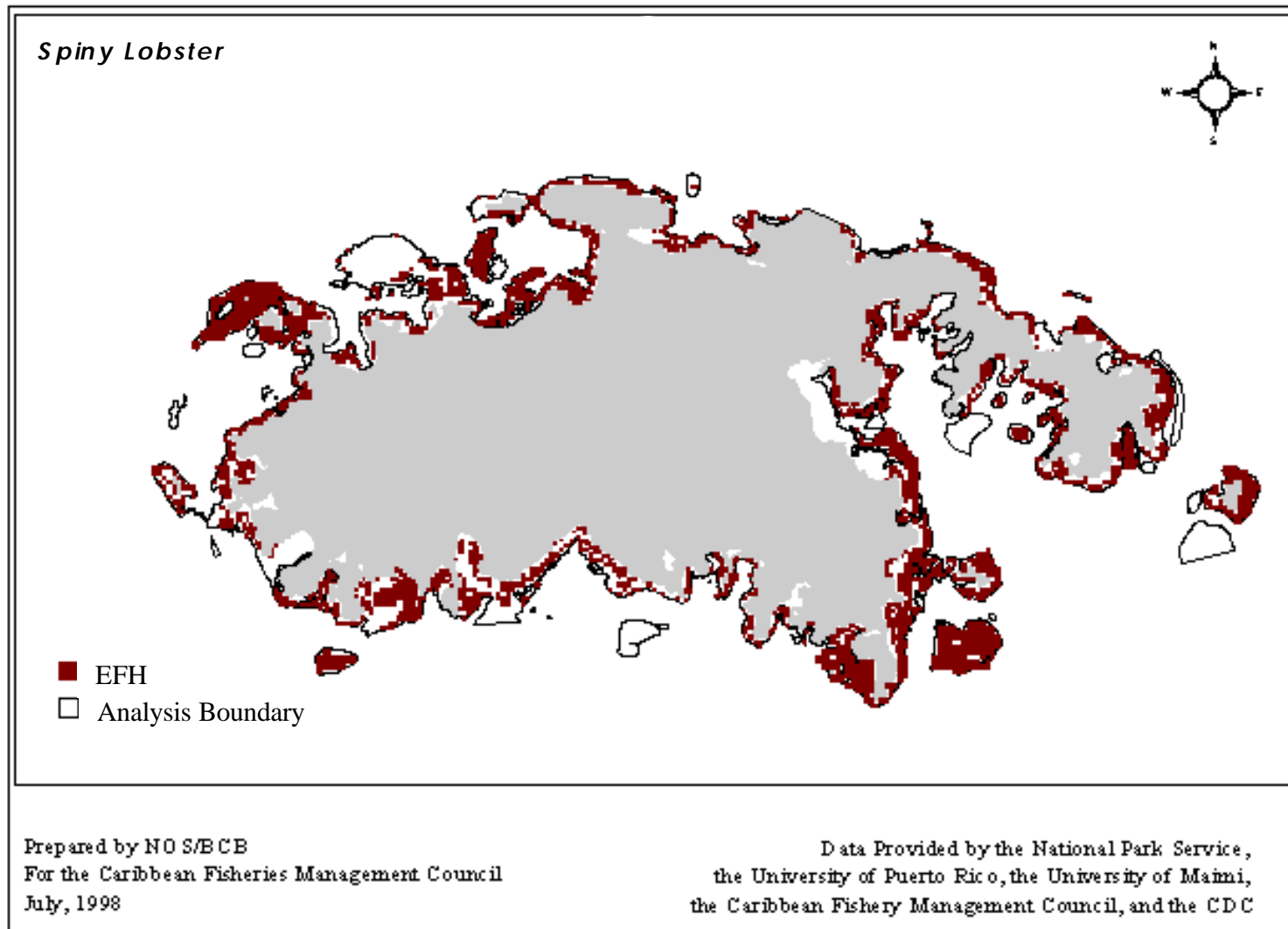


Figure 2.44. EFH designation for Spiny Lobster under Spiny Lobster Alternative 8.

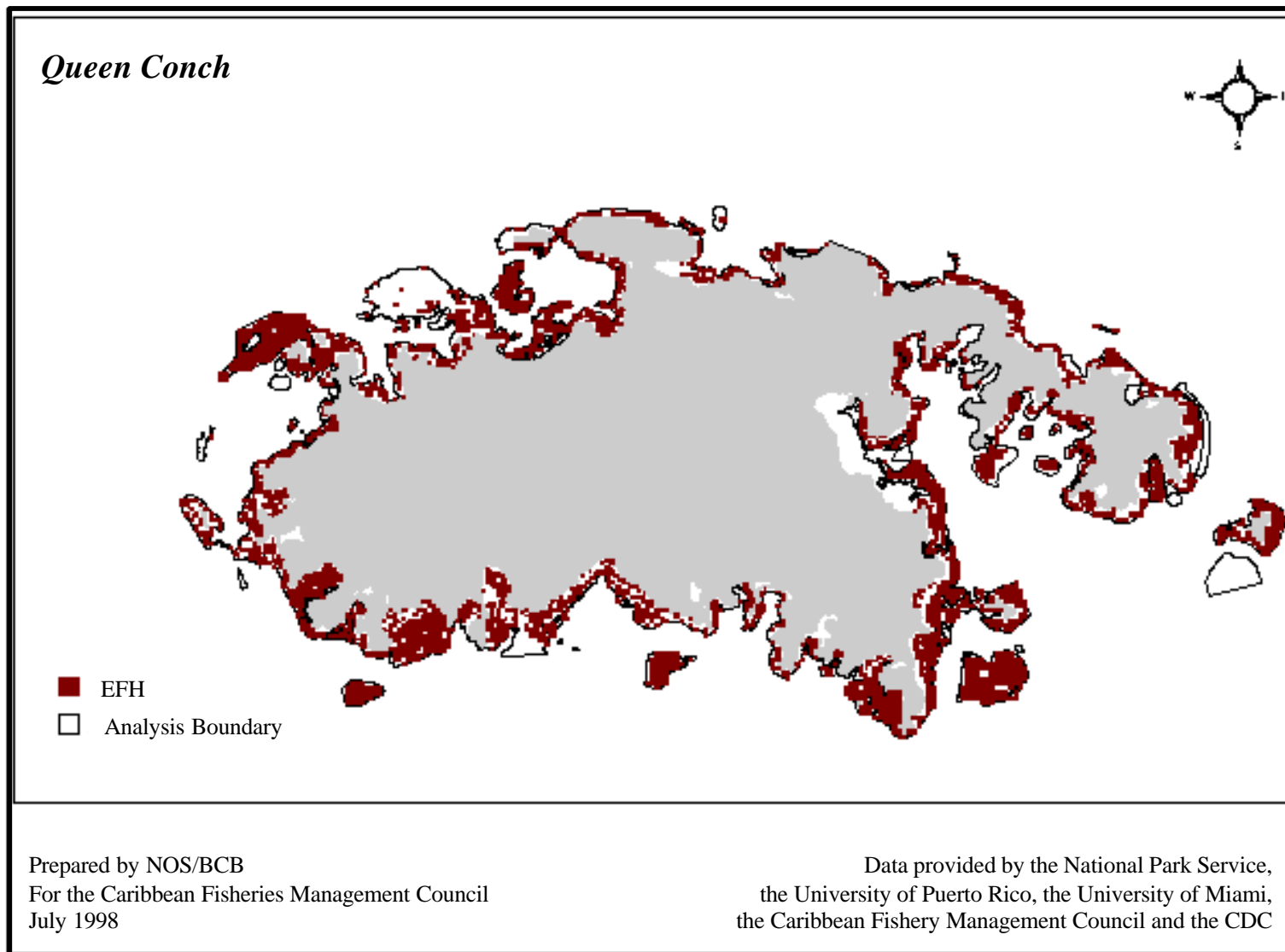


Figure 2.45. EFH designation for Queen Conch under Queen Conch Alternative 8.

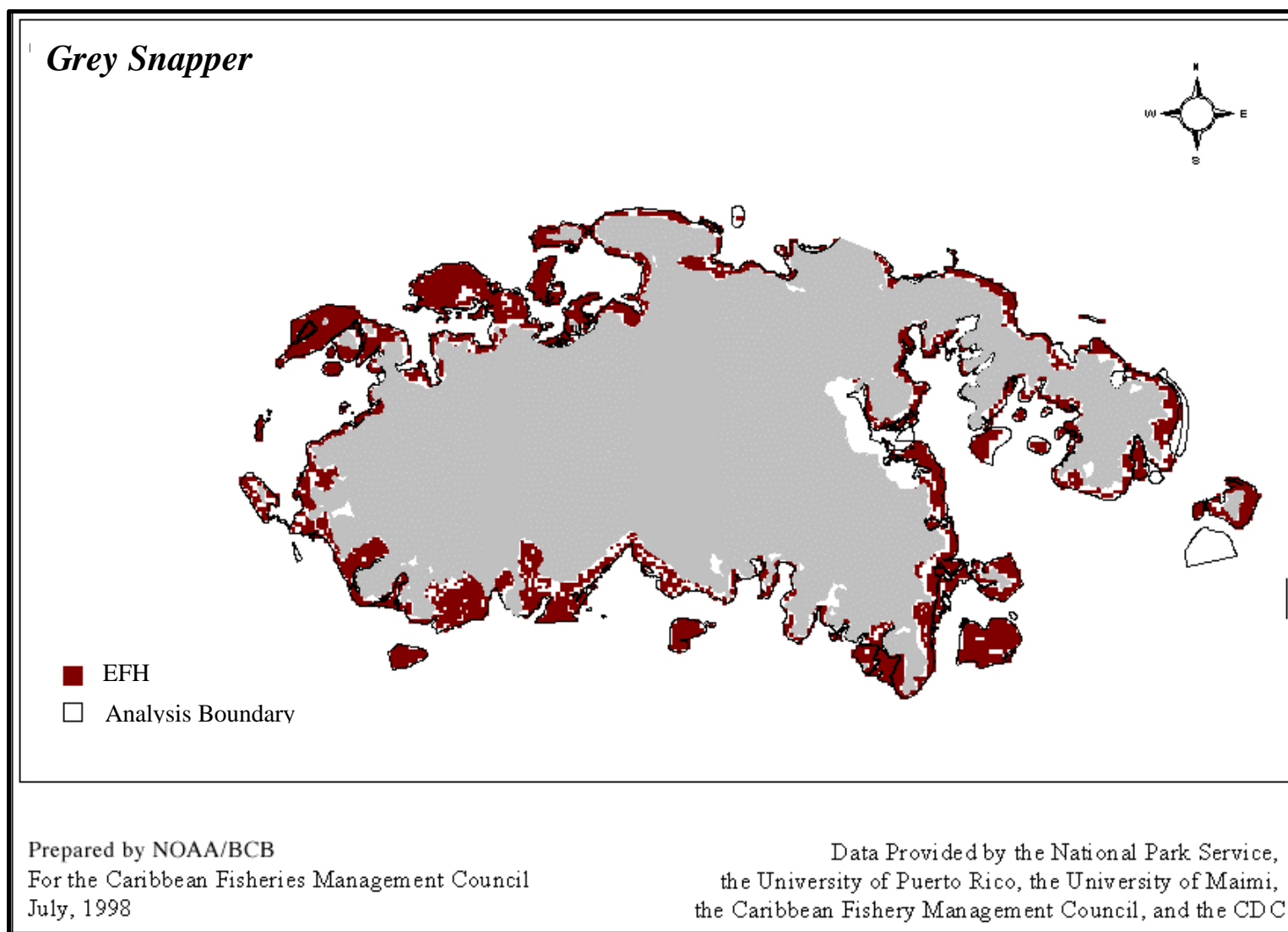


Figure 2.46. Composite EFH for Reef Fish species under Reef Fish Alternative 8, based on grey snapper.

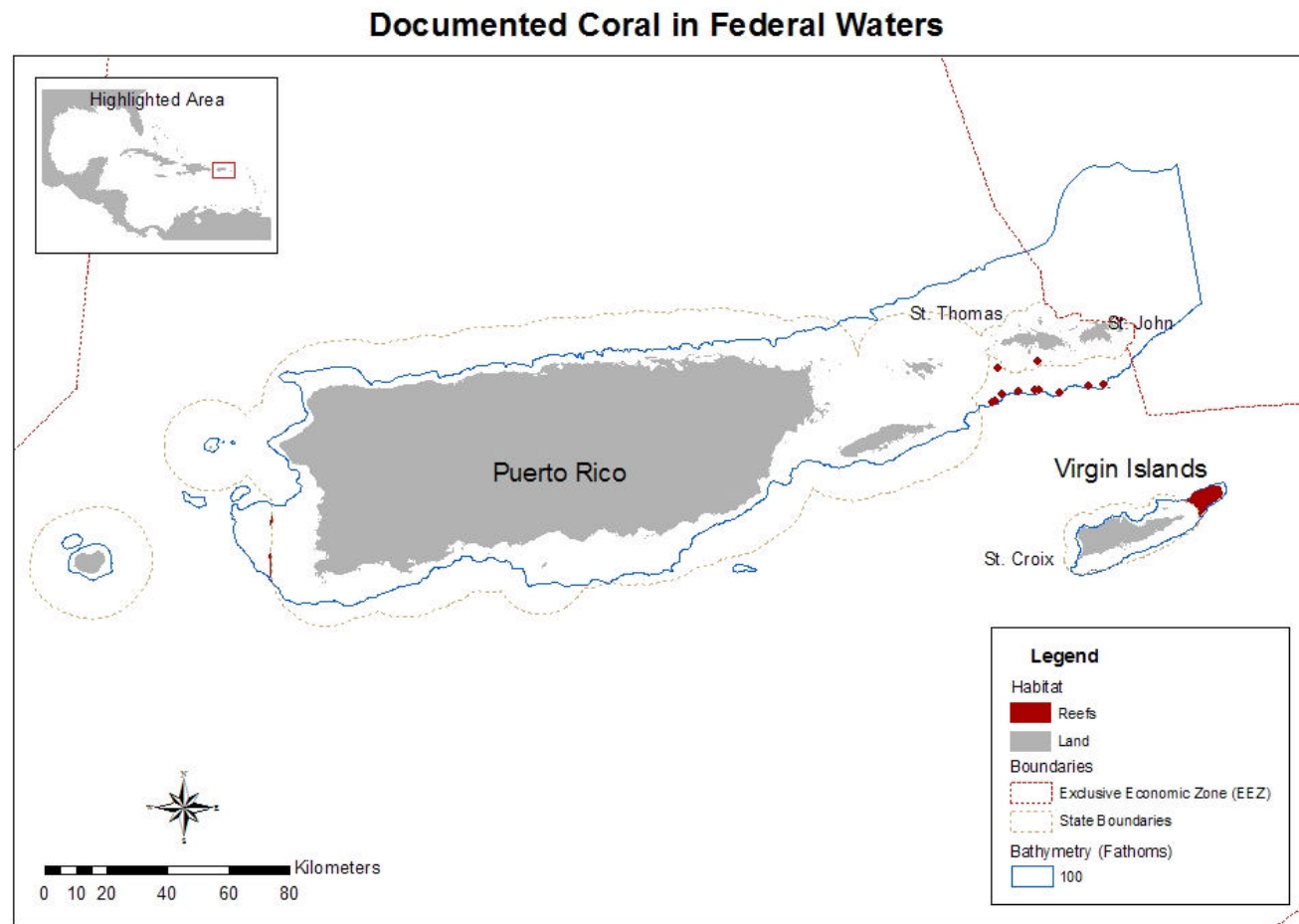


Figure 2.47. Documented coral habitat in Federal waters, from Kendall et al. (2001) and Richard Nemeth (University of the Virgin Islands, personal communication)

**Figure 3: Reported per cent of catch by gear
Puerto Rico**

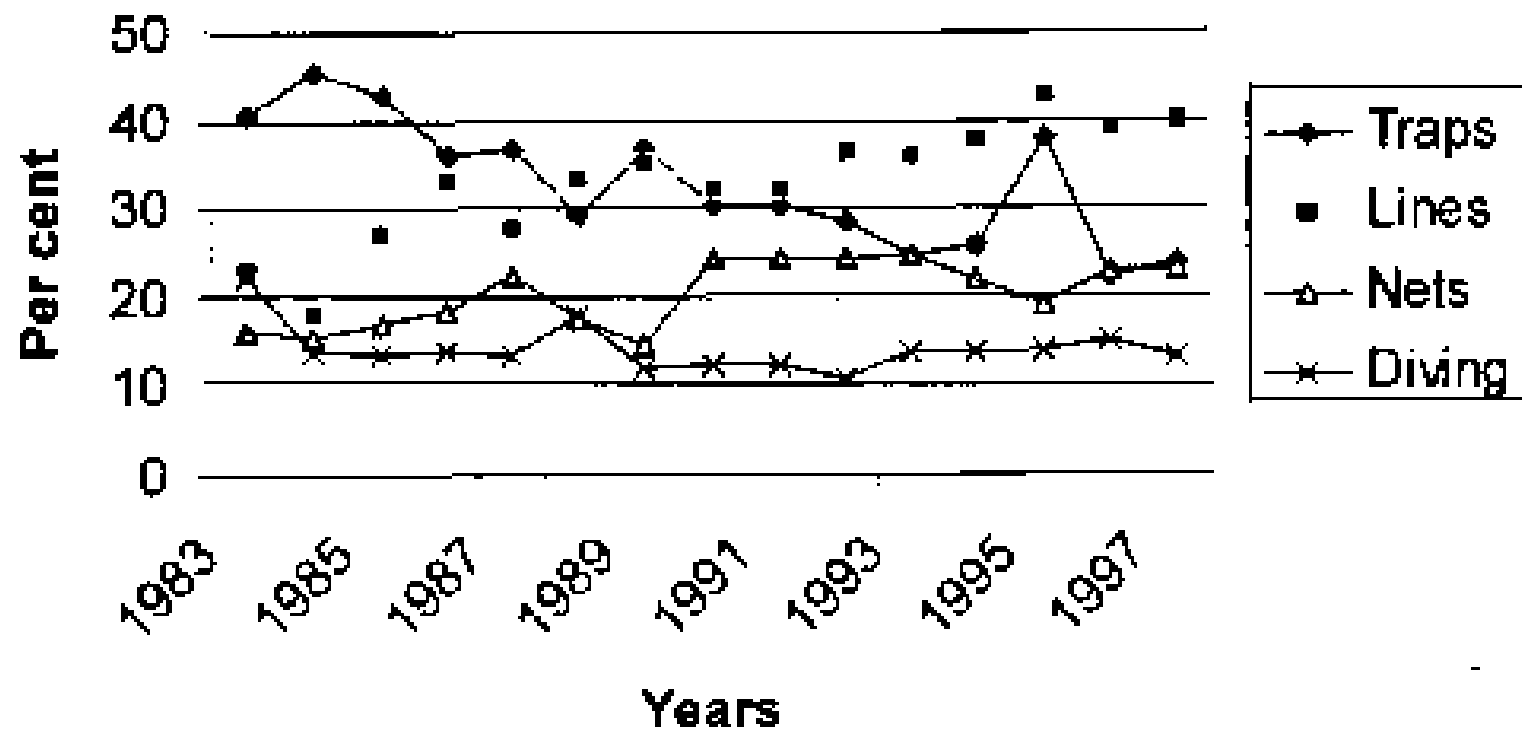


Figure 3.1. Relative distribution of catch by gear reported for Puerto Rico (CFMC 2001)

**Figure 4: Percent of Total Catch by Gear
(St. Thomas)**

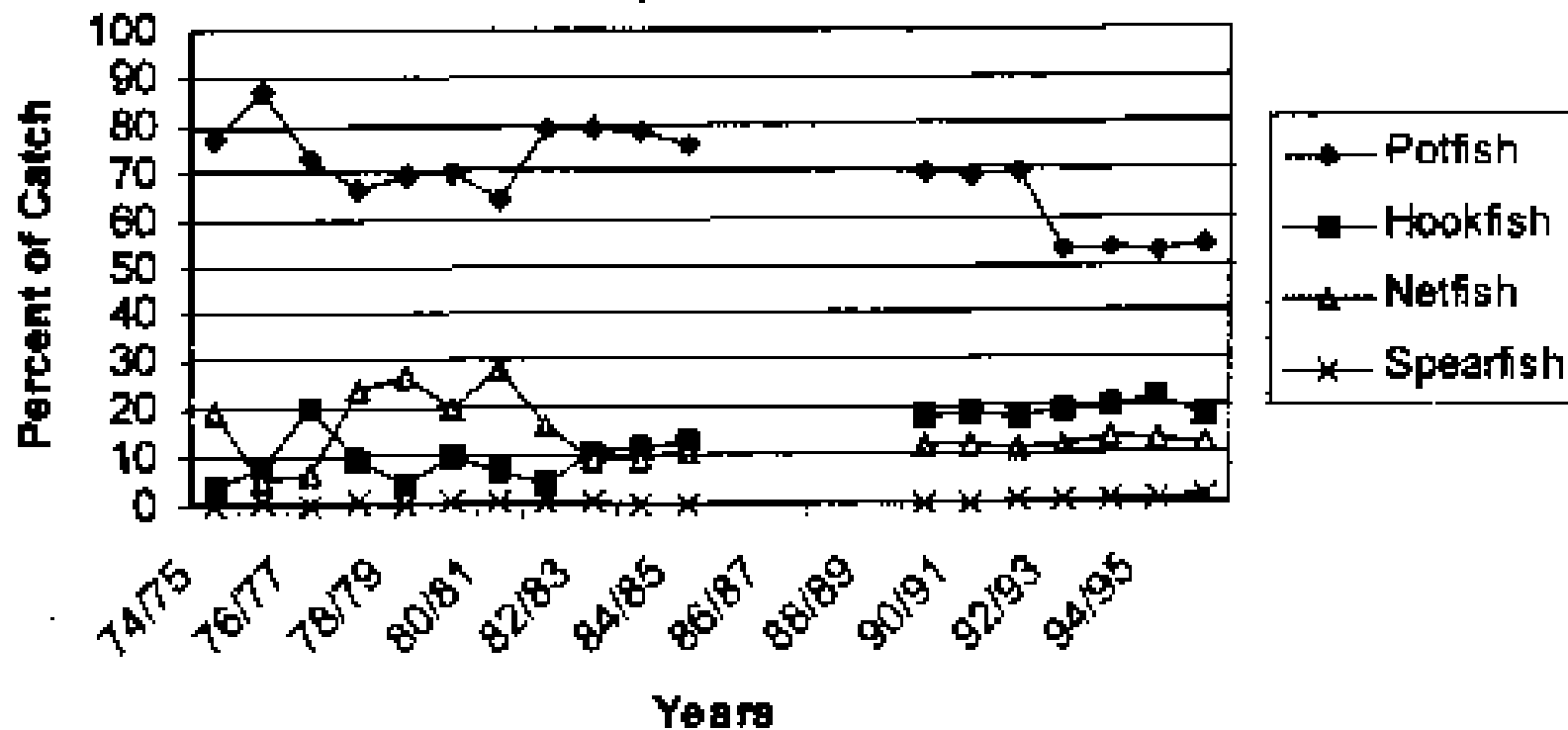


Figure 3.2. Relative distribution of catch by gear reported for St. Thomas (CFMC 2001)

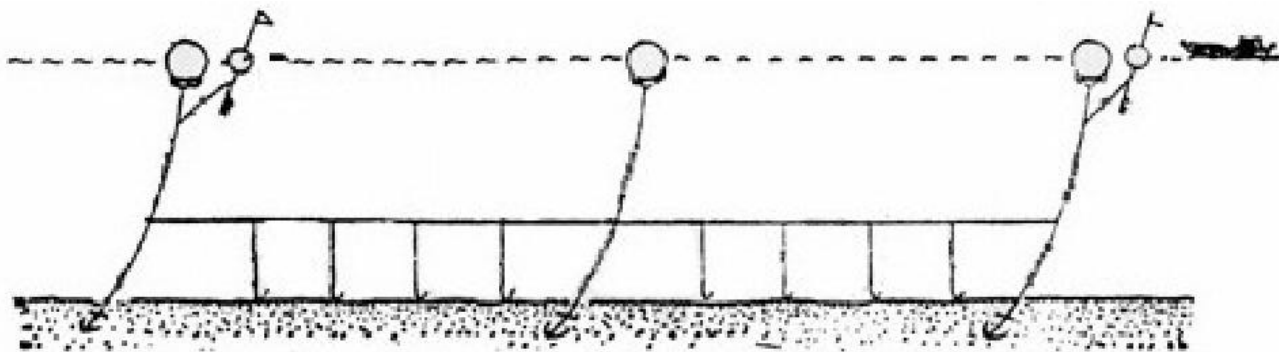


Figure 3.3. Schematic diagram of longline gear (From Barnette 2001)

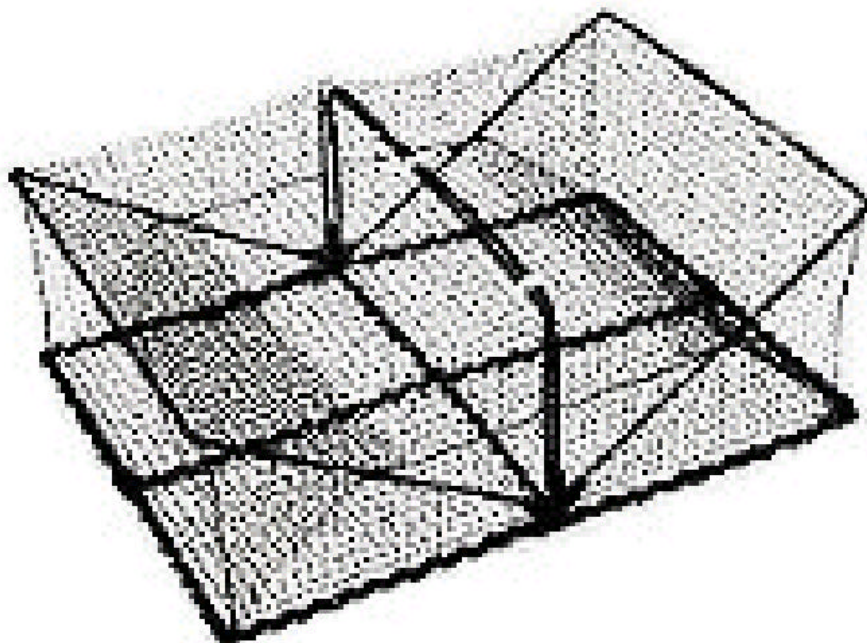


Figure 3.4. Schematic fish trap gear (From Barnette 2001)



Figure 3.5. Schematic speargun gear (From Barnette 2001)

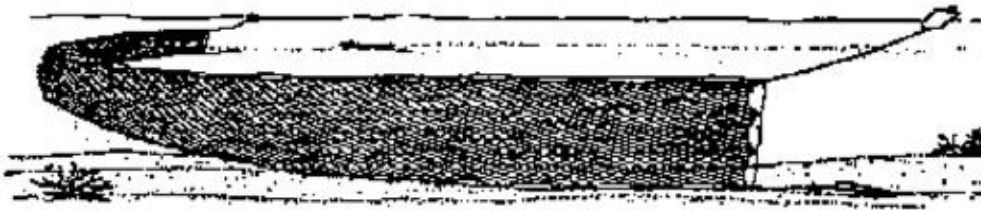


Figure 3.6. Schematic diagram of a gillnet (From Barnette 2001).

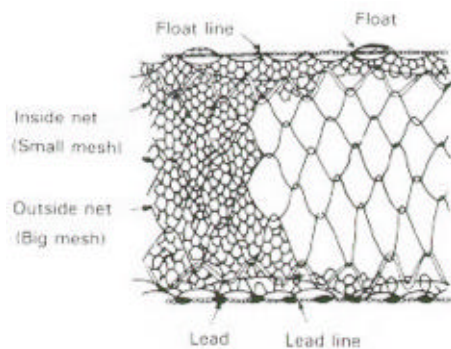


Figure 3.7. Schematic diagram of a trammel net (From Barnette 2001)



Figure 3.8. Schematic slurp gun gear (From Barnette 2001)

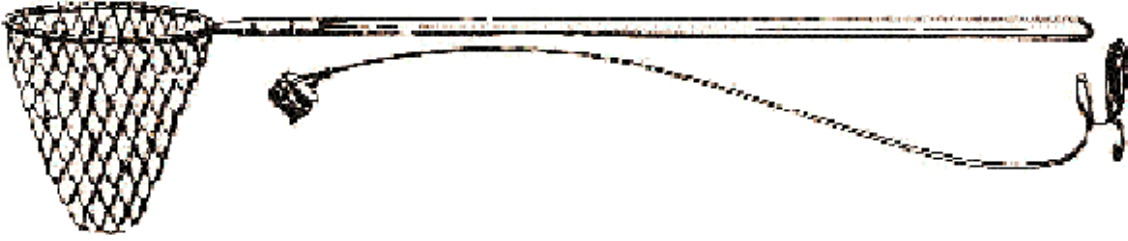


Figure 3.9. Schematic diagram of a dip net (From Barnette 2001)



Figure 3.10. Schematic diagram of a tropical fish net (From Barnette 2001)

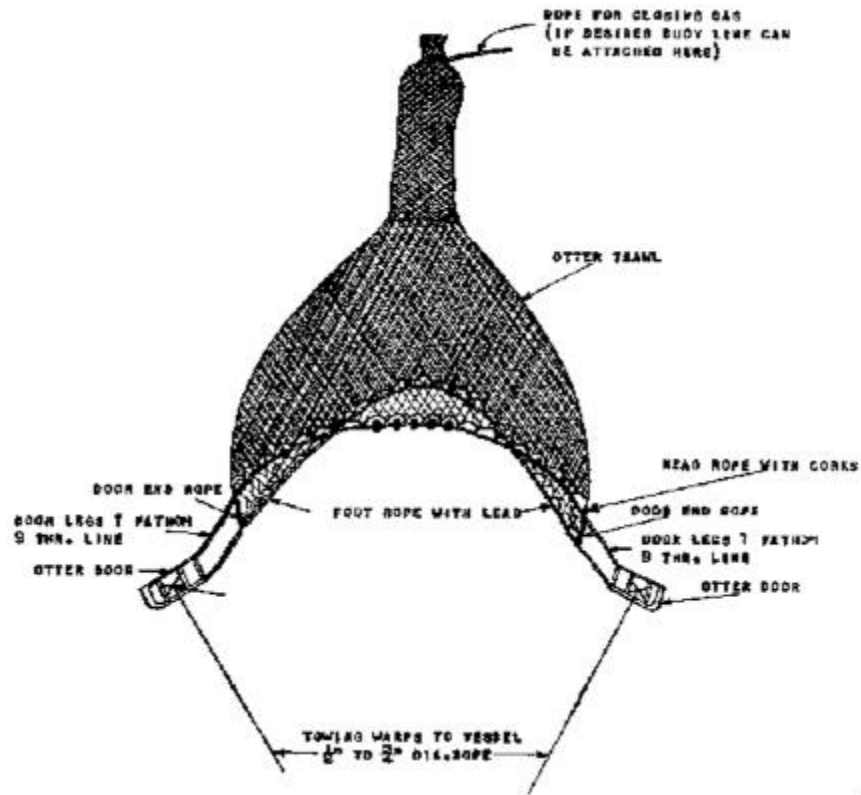


Figure 3.11. Schematic diagram of an otter trawl (From Barnette 2001)

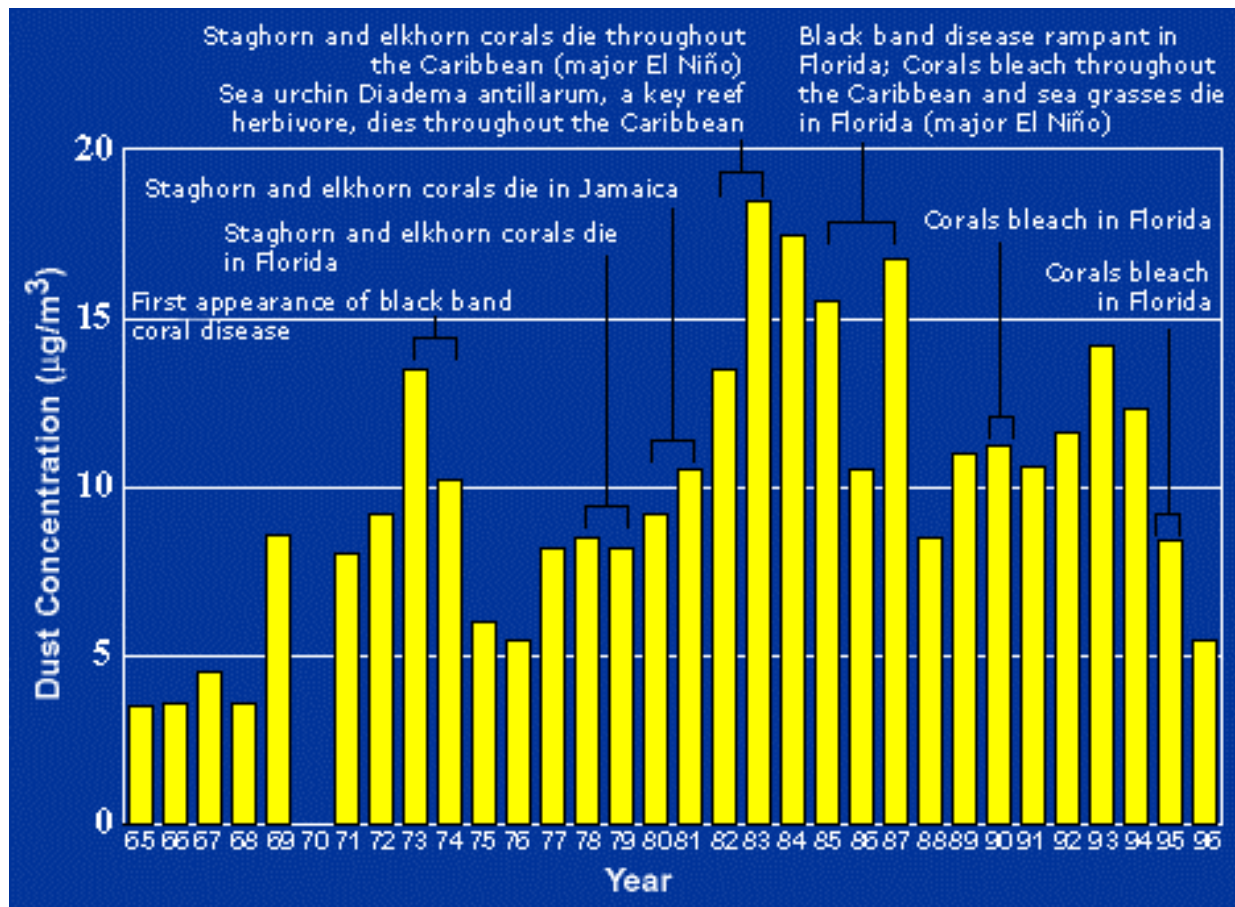


Figure 3.12. Barbados Mineral Dust Annual Average and Benchmark Caribbean Events

African dust deposition peaked in 1983 and 1987, years when extensive environmental change was evident in Caribbean coral reefs. (Image adapted from the USGS Center for Coastal Geology: Coral Mortality and African Dust (USGS 2001), courtesy of Dr. Joe Prospero, University of Miami.)

Habitat NOS

La Parguera, Puerto Rico

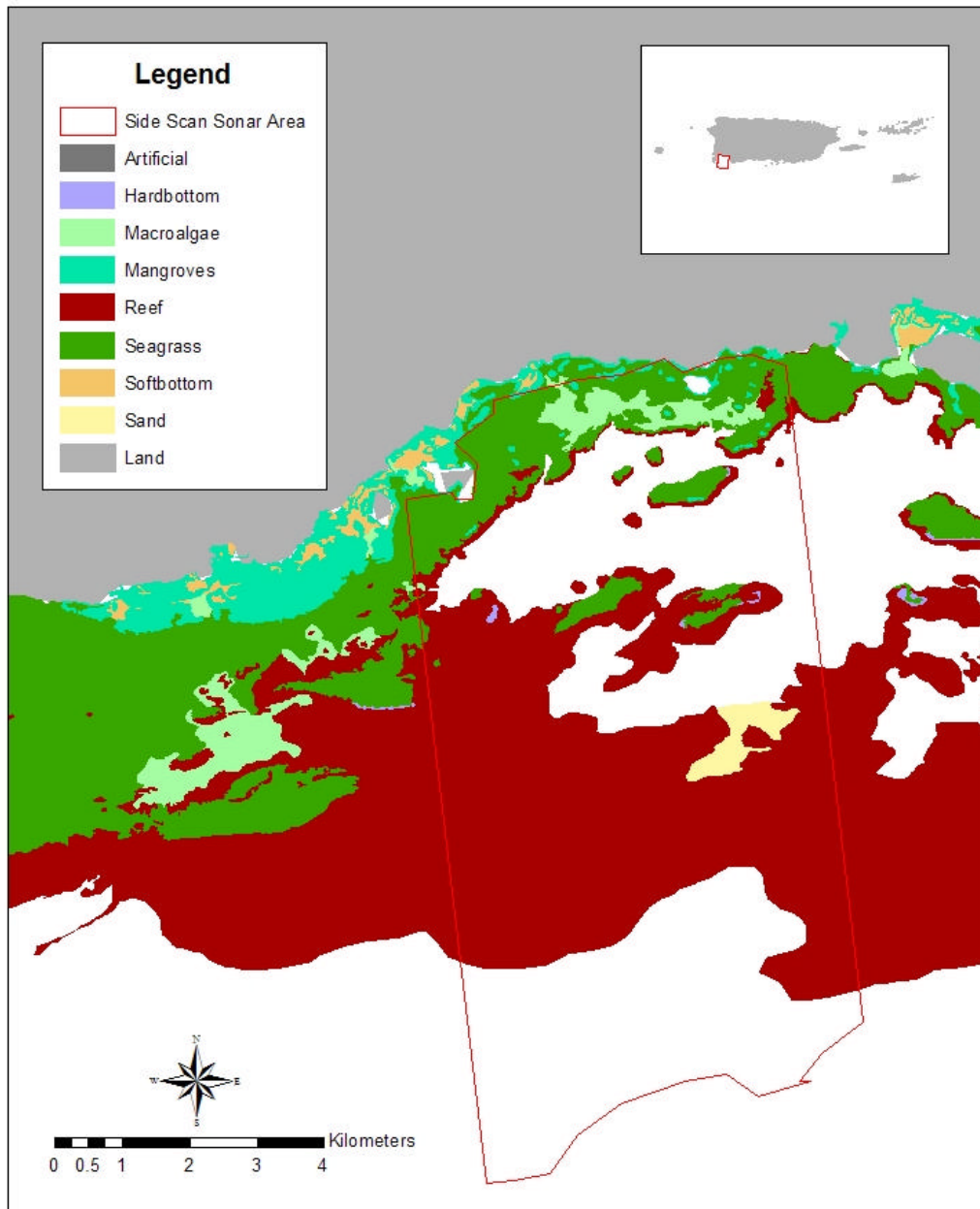


Figure 4.1a. Comparison of habitat distribution obtained by aerial photography (4.1a) (Kendall et al. 2001) and side scan sonar (4.1b) (Prada 2002) for the Parguera area of southwest Puerto Rico

Habitat: Side Scan Sonar

La Parguera, Puerto Rico

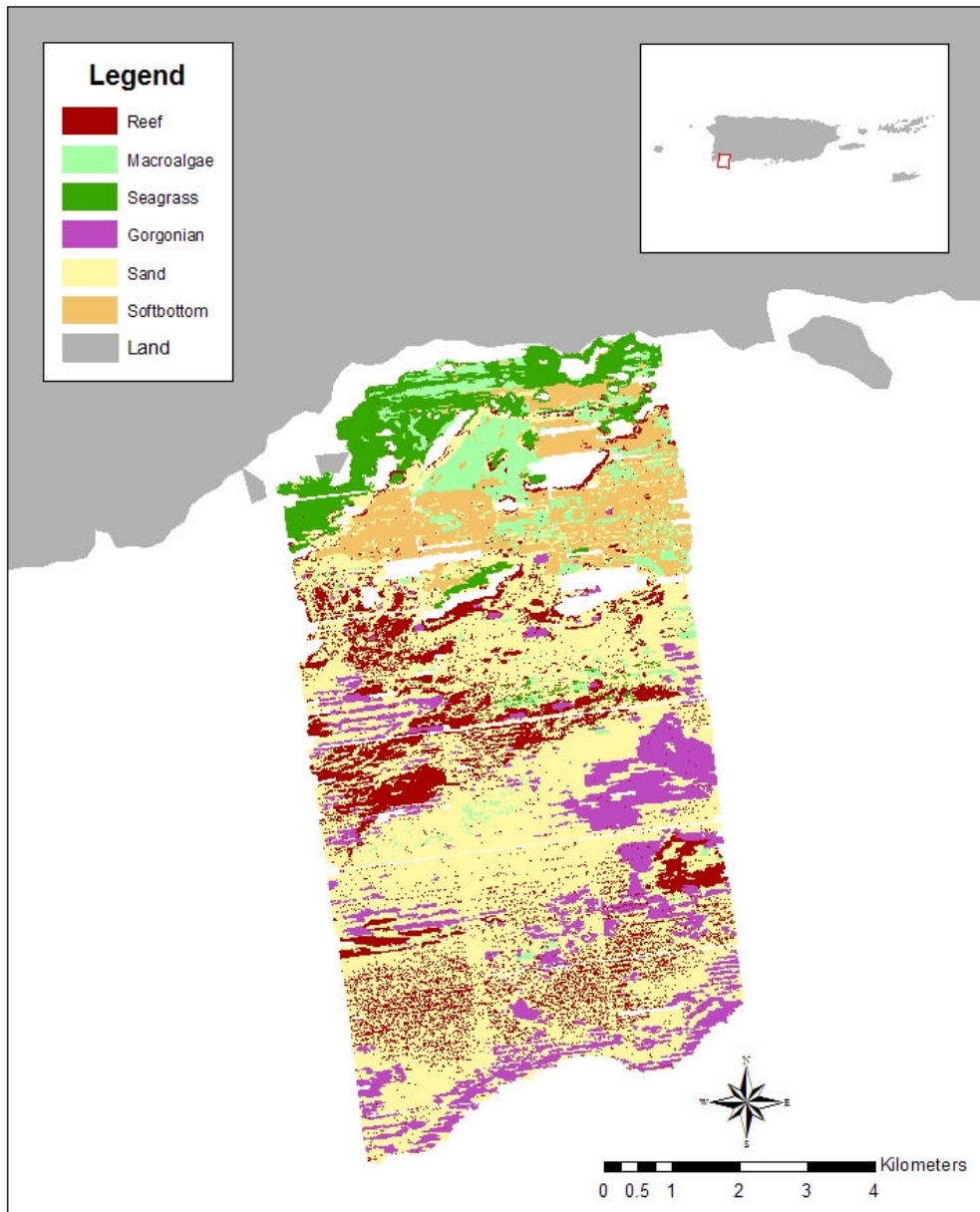


Figure 4.1b. Comparison of habitat distribution obtained by aerial photography (4.1a) (Kendall et al. 2001) and side scan sonar (4.1b) (Prada 2002) for the Parguera area of southwest Puerto Rico

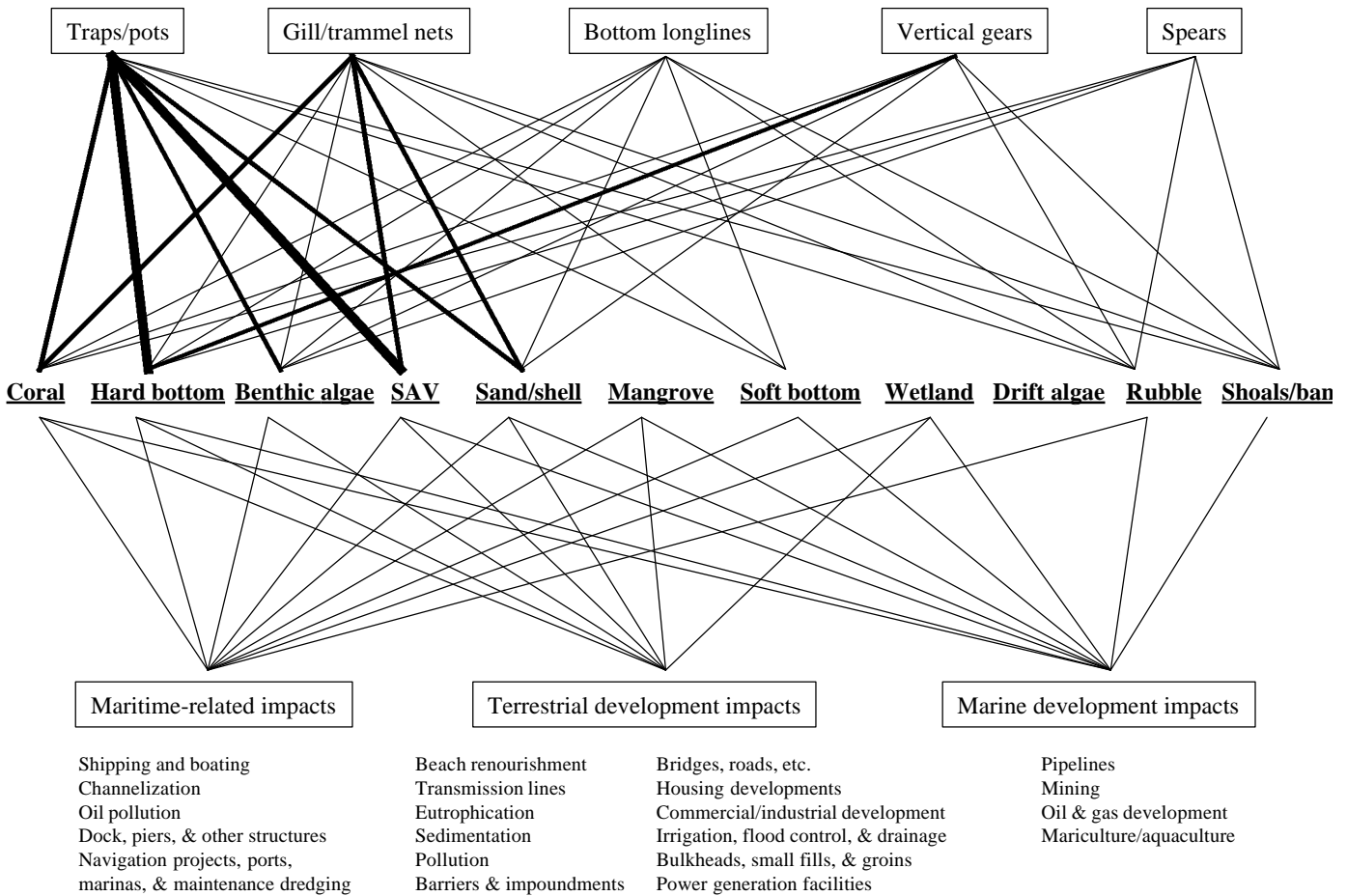


Figure 4.2 Network diagram of cumulative fishing and non-fishing activities on fish habitats in the US Caribbean.

Top row represent fishing gears potentially affecting habitats. Middle row represents potentially affected habitats. Bottom row represents non-fishing activities potentially affecting habitats. For fishing gears, increasing line thickness indicates increasing potential for habitat damage (negligible, low, or moderate fishing impact risks). Similar information not available for non-fishing impacts.